THIS WEEK'S National Petroleum NEWS

Index to Coming Meetings

Oil Equipment and Engineering Exposition, Shrine Auditorium, Los Angeles, March 16 to 23.

Independent Oil Men of America, Chicago, March 17, 18.

American Society for Testing Materials, regional meeting, Book-Cadillac Hotel, Detroit, Mich., March 19.

Michigan Oil Men's Association, Statler Hotel, Detroit, March 19, 20, 21.

American Association of Petroleum Geologists, Roosevelt Hotel, New Orleans, La., March 20, 21 and 22.

American Petroleum Institute, Eastern District, Division of Production, William Penn Hotel, April 7.

American Chemical Society, Atlanta, Ga., April 7 to 11.

American Oil Burner Association and National Oil Burner Show, Hotel Stevens, Chicago, April 7 to 12.

National Petroleum Association, Cleveland Hotel, Cleveland, O., April 23, 24.

American Society for Testing Materials, Atlantic City, N. J., June 23 to 27.

National Safety Council, Petroleum Section, Pittsburgh, Pa., Sept. 29 to Oct. 4.

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HERE'S a dyed-in-the-wool independent marketer of whom his neighbor marketers—out in the state of Nebraska—think enough to elect him for three years consecutively president of the Nebraska Independent Oil Men's Association.

S. A. Wassum organized the Tekamah Oil Co., Tekamah, in 1922 and took over its exclusive ownership in 1926. His early business training was 18 years of station service for the Chicago, St. Paul, Minneapolis and Omaha railroad.

In addition to actively directing his own oil company, he has served as mayor of Tekamah for three terms and has been president of the Board of Education there for 16 years.

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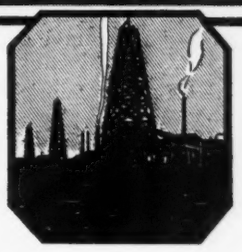

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Vol. 22 **CLEVELAND, March 12** **No. 11**

Refiners Called Upon to Curtail Gasoline Output a Seventh

CLEVELAND, March 11 OVER 150,000 barrels daily is being cut from crude run to stills by the principal refining companies in this country, in answer to the suggestion of the Federal Oil Conservation Board that refining operations generally be reduced to the equivalent of a six-day week, as a conservation measure.

This figure is based on reports from large refineries which reported by telegraph to NATIONAL PETROLEUM NEWS that they had already put into effect the equivalent of a six-day week.

It does not include any of the large number of smaller plants, many of which have indicated they were conforming to the oil board's suggestion.

On the basis of the present 38 per cent yield of gasoline from crude run to stills, this means a daily reduction in gasoline manufacture of about 57,000 barrels.

Total production of gasoline in January in this country was 1,182,000 barrels daily. A seventh reduction from this figure is about 170,000 barrels daily.

Accordingly, the larger units in the refining industry—based on their reports to NATIONAL PETROLEUM NEWS are achieving about one-third of the reduction in gasoline manufacture for the country, which the Federal Oil Conservation Board has asked the industry to make.

The companies which have reported as already putting their refining operations on the equivalent of a six-day week include the Standard Oil Co. of New Jersey and its subsidiaries; Standard of California; Standard of Indiana; Shell Co. of California; Pure Oil Co.; Union Oil Co. of California; Magnolia Petroleum Co.; Mid-Continent Petroleum Corp.

Not only were the above companies which are also producers of crude oil reducing their refining operations, but they were also carrying the curtailment of one-seventh back to the production and transporting of oil and to the drilling of wells in some cases.

Crude Runs to March 8

TOTAL crude runs to stills for 95 per cent of the refining capacity of the country, for the week ending March 8, failed to show any particular response to the plea of the Federal Oil Conservation Board March 4 that manufacture of gasoline be put on the equivalent of a six-day week.

However, refiners who adopted the board's suggestion immediately would have had at the most two days of that week to curtail their crude runs.

Total runs to stills as reported to the American Petroleum Institute were 2,532,700 barrels daily average for the week ending March 8. For the week ending March 1 they were 2,600,000 barrels, the week before that 2,516,000 barrels and the week before that 2,486,000 barrels daily average.

The quickness with which the Standard of New Jersey interests put into effect the oil board's suggestion, carrying it back to their producing operations is indicated by the fact that the Carter Oil Co., a producing subsidiary in the Mid-Continent field, by closing its producing leases down Sunday, March 9, reduced its production on that day from 70,000 barrels to a little better than 1000 barrels, this coming from wells making water and requiring continuous pumping. The Oklahoma Pipe Line Co., another subsidiary, shut its pipe lines down entirely on March 9.

Still further, at least two principal companies importing crude in one case and gasoline in the other, the Standard of New Jersey and Standard of Indiana interests, announced they were making equivalent reductions in the volume of outside oil brought into this country.

The Federal Oil Conservation Board's suggestion for a curtailment in gasoline manufacture, in the interests of conservation, which was made March 4, is the first time the oil board has suggested any control over the operations of the oil industry.

Secretary of the Interior Wilbur, chairman of the board, announced in Washington March 10 that he had named a committee of five oil men, who are by nature economists and statisticians, to make a "complete and unprejudiced analysis of the status of petroleum demand and consumption for 1930."

Secretary Wilbur's thought was that the oil board should be able to show the oil industry and the coun-

try that curtailment in refining is an immediate necessity.

The original suggestion of the oil board for the equivalent of Sunday closing brought some confusion in the industry, where it was first interpreted to mean actual closing down of refining plants on Sunday. The first announcement of the oil board's plan came in a statement from Secretary Wilbur March 4 that he had written the governors of Oklahoma, Kansas and Texas, to ask them if they would not call attention of the refiners of their states to the possibility of a six-day operating week.

The letter to these governors stated that the oil board wished to call attention of the executives to the desirability of pointing out to the refineries the advantage that would accrue from Sunday closing. In another paragraph of the letter to governors the statement was made that the oil board "wishes to suggest that the refining of petroleum could well be brought to the normal basis of a six-day week."

The heads of many refineries stated it would not be feasible to shut down refining operations entirely for one day a week, due to the loss of heat used in many refining operations which would occur; also due to the length of time it would take to bring stills back on stream after the plant had started up again; and also due to the fact that equipment would depreciate at a greater rate when subjected to alternate heat and cold than when maintained at operating temperatures.

Secretary Wilbur later stated that the board had in mind the putting of gasoline manufacture on the basis of a six-day week, rather than actually closing down of plants on Sundays, if that were not feasible.

Two days later the Standard Oil Co. of New Jersey publicly announced that it was impractical for it to close down all refining operations for one day; but that it was closing Sundays where practical and, elsewhere, was putting its plants on the equivalent of a six-day week, and that it was extending the same curtailment to its drilling and producing operations.

Secretary Wilbur later in the week, after representatives of the refining industry had told him it would be unfair to call upon refiners in Oklahoma, Texas and California to curtail and let those elsewhere operate at capacity, if they chose, sent sim-

Refineries Reporting Curtailment in Operations

By Telegraph

Associated Oil Co.—Cut refinery runs Feb. 1 by more than one-seventh compared to January and daily average for 1929. Reduced production of crude 47 per cent March 1 from potential of 77,000 barrels to allowable of 40,700 barrels.

Standard Oil Co. of California—Has reduced refinery operations to six-day a week basis. Has greatly reduced production under state curtailment plan.

Standard Oil Co. of Indiana—Made further reduction in refinery runs, conforming to Oil Board's recommendation of six-day week, although company has been running only enough crude to meet requirements and stocks are less than a year ago. Will reduce amount of gasoline imported.

Standard Oil Co. of New Jersey—Shut down refinery operations on Sunday where possible, or otherwise curtailed operations one-seventh. Refinery runs less in January and February than year before. Crude and gasoline stocks of subsidiary companies less than they were on corresponding dates year ago. Crude production receipts of imported crude and products, purchases, drilling and transportation activities reduced one-seventh.

Humble Oil & Refining Co.—Refinery operations curtailed to produce one-seventh less gasoline although operations previously were in balance and gasoline stocks had not been increased above 1929 level. Crude production reduced one-seventh except in prorated areas where Humble will join other producers in asking lower production allowances from state authorities.

Standard Oil Co. of New York—Atlantic seaboard plants now running about 80 per cent of normal, with reduced gasoline output.

Carter Oil Co.—Shut down practically all producing leases on Sunday March 9. Gasoline plant operations reduced to barest necessity.

Continent Oil Co.—Running now at 50 per cent of refining capacity, which is 25 per cent less than running reported by American Petroleum Institute for 95 per cent of United States refining capacity.

Phillips Petroleum Co.—For some time running less crude than necessary to meet requirements through its own marketing facilities and buying gasoline outside. Cutting crude production one-seventh.

Pure Oil Co.—Adopting the six-day week basis and will make only enough gasoline to supply its own distributing facilities. Present gasoline stocks represent only 24 days' supply for its own outlets from all its six refineries. Curtailing crude production to about 50 per cent of potential.

Shell Co. of California—Refinery operations already reduced 8 per cent below last year. Now being reduced 15 per cent more. Under voluntary curtailment program crude production limited to 50 per cent of potential.

Union Oil Co. of California—1930 scheduled refinery operations contemplate 15 per cent reduction from operations of 1929. Company has at present 52,000 barrels of crude shut in.

Sinclair Consolidated Oil Corp.—Refinery operations reduced several months ago. Stocks of gasoline now only enough to meet current requirements. Production of crude curtailed.

Standard Oil Co. of Louisiana—Curtailed refinery operations one-seventh starting March 9. Operations previously were about same as year ago. Crude production curtailed one-seventh.

Magnolia Petroleum Co.—Curtailed refinery operations to basis of six-day week. Reduced crude production one-seventh.

Mid-Continent Petroleum Corp.—Adopted six-day week refining program, although runs of crude were 15 per cent less than year ago. Crude production curtailed in line with Oklahoma proration program.

Skelly Oil Co.—Refining now running at half capacity, less than year ago. Gasoline stocks are less than year ago. Adhering to general curtailment program on production.

Standard Oil Co. of Ohio—Reduced refinery operations by 40 per cent on Jan. 1.

Tide Water Oil Co.—Planning to curtail at once, according to Oil Board's recommendations.

Ohio Oil Co.—Cut runs at Robinson, Ill. refinery March 8 to equivalent of 5 days a month. Has closed Sundays all wells that can be shut in. No Sunday drilling.

Indian Refining Co.—Reduced runs to less than six-sevenths of normal crude throughput.

Derby Oil Co.—Curtailed crude runs 60 per cent in January and February.

Oklahoma Pipe Line Co.—Shut down pipe line completely March 9.

Shell Petroleum Corp.—Runs were reduced some time ago at refineries in the Mid-Continent and Indiana territory so that stocks of gasoline on April 1 will be substantially less than stocks a year ago. Company is still considering further the matter with a view to bring refinery operations down in line with suggestion of federal oil board.

The Industry's Opportunity at Hand

By Warren C. Platt, Editor

IN ACCEDING to the appeal of Secretary Wilbur, for the Federal Oil Conservation Board, to restrict refinery output one-seventh, the oil industry, has an opportunity immediately to put its house in order for the coming gasoline season.

If the industry does not grant the appeal but continues as at present, there will be some twenty million barrels of *extra surplus* gasoline stocks hanging over the market, an amount which sooner or later will so break down prices well into red figures as to force a sufficient reduction of refinery output to enable the markets to absorb the surplus.

The application of that remedy will be exceedingly costly and perhaps even fatal to some companies. The application of the Conservation Board's remedy may cost a little money, but nowhere near what bankrupt prices will cost. Today's low prices are liable to continue, if the board's request is ignored, thereby adding to the expense of passing up this opportunity.

Every refinery executive should take this appeal to heart and put it in practice at once. If he has cut down recently he should cut down again. The only way this extra twenty million barrels can be consumed is for the industry to produce that much less gasoline than is needed. If everyone runs along on an evenly balanced basis—which they didn't do last year—that twenty billion barrels will hang over the market, causing just as much damage as if the industry were adding to it, instead of staying even.

The big companies have promptly announced their application of the Board's remedy, President Teagle of the Standard of New Jersey saying that, even though they have been in balance this winter and have no stocks of gasoline on hand, they are cutting down an additional seventh to allow the present general surplus of gasoline to be worked up.

The appeal of the conservation board is quite within the province of the government. Such appeals have been issued for years by the department of agriculture, telling the farmers to plant more or less as the case might be. If it is fair and lawful for one department to do this to the vast farming industry, it certainly is equally fair and lawful for another department to do it for another industry, particularly as it is an industry of a wasting natural resource, in the intelligent use of which every man, woman and child in the country has a lawful interest.

Some governors may take a narrow view of it, but, if they admit of the practice of warning the farmer against planting surpluses, they must admit of this. The governor of Texas did not do himself any credit when he replied to the conservation board's appeal that his people were interested only in cheap gasoline. Governor Moody overlooks the fact that the governors of most states could well reply to the pleas of the department of agriculture that their people are only interested in cheap cotton and that Texas should keep raising cotton until the price gets down to nothing at all.

This appeal of the conservation board is a real godsend to the oil industry and it should be acted upon at once. No general panacea for the industry's ills can be devised that will be fair to a gnat's eyelash to every single refinery. This is the best and most instantly practical suggestion made yet. It puts it up to every refinery man in the industry to decide whether he wants to help get the industry on a sound basis, or would he prefer to flounder along the rest of the year with a flood of gasoline ready to kill the market.

And the time to make that decision is right now.

Profits or losses. Take your pick.

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ilar letters to the governors of other states where the refining of petroleum is an important industry.

So far Secretary Wilbur has not announced the response from the governors. It is understood that Governor Moody, of Texas, replied that he would not call upon refiners in his state to curtail their operations, in the belief that such action might lead to higher prices for gasoline there. It is also understood that Governor Halloway, of Oklahoma, has written to refiners in his state asking them to adhere to the suggestion of the oil board.

In the Mid-Continent a large number of plants are expected to reduce their crude runs in line with the suggestion of the oil board, although these refiners failed last year to obtain what they consider an adequate share of the increased gasoline business of that year and showed virtually no increase in shipments over the year before.

It is the general opinion of these refiners that their stocks of gasoline on April 1 will not exceed what was on hand April 1 a year ago.

"Generally speaking, the refineries of Kansas, Oklahoma, North Texas, Arkansas and North Louisiana have been running on a curtailed basis for two or three years," W. G. Skelly, president of the Skelly Oil Co., Tulsa, wired NATIONAL PETROLEUM NEWS.

"Also, there has been a negligible enlargement of capacity among these plants. Our own refinery at Eldorado, Kans., with 23,000 barrels throughput capacity, has not been enlarged in several years and has rarely exceeded 50 to 60 per cent of capacity in actual oil run.

"The present over production of gasoline is due largely to the excessive operations of large refineries in Venezuela, California, and on the Gulf and Atlantic seaboards and in the Great Lakes district. Many large companies operating such plants have not only run at capacity, but in some cases have greatly increased that capacity."

Jacob France, president of the Mid-Continent Petroleum Corp., Tulsa, said he believed refining companies in the Mid-Continent were in sympathy with the suggestion of the oil board and would curtail their runs immediately.

The presidents of many refining companies, in reporting to NATIONAL PETROLEUM NEWS the status of their plants under the curtailment plan suggested by the oil board, emphasized the importance to the oil industry generally of cooperating in the movement.

"Our company plans to continue the policy of reduced crude charges as long as conditions indicate its economic soundness and welcomes further cooperative efforts in restricting the production of crude oil even below the levels now agreed upon," said William F. Humphreys, president of the Associated Oil Co., San Francisco. "By this means the underlying cause of the present over production of gasoline may be corrected at its source."

"Our companies are making a com-

plete and wholehearted effort to carry out the spirit of the conservation board's request, in the belief that the entire industry will be benefited," stated W. C. Teagle, president of the Standard Oil Co. of New Jersey.

The Standard Oil Co. of Indiana stated that, in reducing its refinery operations and also in reducing imports of gasoline by itself and affiliated companies, its "action was taken with the thought of contributing to the general good of the industry and conforming in principle to the federal oil board's recommendation."

Why a one-day shutdown is impractical is summarized by the Standard of New Jersey in this statement of its position which it issued March 5:

"The Federal Oil Conservation Board has suggested that gasoline refining operations be put upon the basis of a six-day week in order that the waste incident to the increasing of surplus stocks may be avoided.

"Certain operations of the oil industry, such as drilling, producing, construction and pipeline transportation are susceptible to one-day closing. Inasmuch as oil refining is a continuous operation it is not practicable to completely shut down for one day each week, but the same results will be accomplished if the week's operations are reduced one-seventh in volume.

"Accordingly, beginning March 9, and thereafter until further notice, the Standard Oil Co. of New Jersey will reduce its refinery operations one-seventh in volume. This involves a corresponding reduction in the company's receipts of crude oil, and since manifestly it would be unjust to discriminate between domestic and foreign producers, this reduction will apply alike to domestic crude and to imports of crude and products.

"Throughout the company's operations a six-day week already is in effect, and where through the nature of the business Sunday employment is necessary with certain employes a day's rest is accorded during the week. This curtailment in operations will involve no reduction in personnel or payrolls.

"This step is taken as an aid in relieving the present situation of overproduction of crude and gasoline by the industry as a whole, although the Standard Oil Co. of New Jersey has not itself accumulated an excess of crude and gasoline and its operations have for a long time been in balance."

Humble Oil & Refining Co. and Standard Oil Co. of Louisiana, both of the New Jersey family, began curtailment March 9, they announced. D. R. Weller, president of the Louisiana company, said purchase of crude oil would be curtailed one seventh the same as refinery runs in order that "the waste incident to the increasing of surplus stocks may be avoided."

W. S. Farish, president of the Humble, said his company and the Humble Pipeline Co. would shut down all its operations where physically possible.

"These companies," said Mr. Farish, "have not participated in the accumulation of excess of stocks of crude and gasoline and their operating program is now in balance; nevertheless, they are adopting this policy, both on account of their consistent desire to cooperate with conservation authorities and also because they see in this suggestion of the Federal Oil Conservation Board, if followed by a corresponding reduction in crude producing and transporting operations, a practical means of relieving the situation which has resulted from the overproduction of crude and gasoline by the industry as a whole.

"The suggestion of the board relates only to the production of gasoline. It is obvious, however, that if refinery operations are decreased the volume of raw material must of necessity be decreased in like proportion, as otherwise the waste which the conservation board is seeking to avoid would be merely transferred from storage stocks of gasoline to storage stocks of crude."

Humble operates several small plants in Texas in addition to the 125,000-barrel plant at Baytown and it is considered relatively simpler to reduce runs in varying percentages at various plants than to close certain units. It is understood there will be no attempt to cut individual units within plants below normal operating efficiencies.

At present it is thought Humble's pipe line facilities will be adjusted to the equivalent of six-day operation because a physical shutdown is not permitted by operating conditions.

The Standard Oil Co. of California will participate in the curtailment effort even to the extent of buying some of its requirements from other California refineries, it announced. This company's statement and outline of the situation on the Pacific coast follows:

"The Standard Oil Co. of California announces that, effective immediately, it will operate its refineries on the equivalent of a six-day week. Refinery operations of necessity being continuous, this will be accomplished by reducing the weekly runs of crude oil one seventh. This will be done without the laying off of any labor and without any reduction in pay.

"The Standard Oil Co. of California will continue to operate on the reduced schedule so long as conditions permit and in case this schedule does not produce sufficient gasoline to meet its outstanding obligation, it will purchase gasoline from other California refiners, if such is available, rather than to increase the runs of crude oil to its stills.

"The suggestion of the Federal Oil Conservation Board comes at a particularly opportune time for the California petroleum industry. Under the crude oil curtailment plan in California, the potential production in California of 1,020,000 barrels per day, was reduced on Nov. 1, 1929, to 710,000 barrels per day.

"Under the new curtailment plan effective March 1, it is aimed to still further reduce the production one-seventh or to 609,000 barrels per day. It is estimated that this production of 609,000 barrels, or 60 per cent of the California potential production, is sufficient to meet the requirements of California's natural markets in 1930 and that if the refiners of California reduce their refinery runs of crude oil one-seventh, it will put an immediate stop to the wasteful building up of stocks of gasoline in storage.

"California's stocks of gasoline during 1929 increased at the rate of 15,500 barrels per day or about 5,600,000 barrels for the year and in January of this year these stocks increased at the rate of 44,000 barrels per day."

Three other California companies, Shell Oil Co., Associated Oil Co. and MacMillan Petroleum Corp., have also indicated they would reduce their runs. G. Legh-Jones, president of Shell, said his company would continue the one-seventh curtailment as long as necessary.

General Petroleum Corp. (Standard of New York) has been running 30 per cent less crude to stills than customary and Richfield Oil Co. has been running on a 20 per cent curtailment. It is understood The Texas Co. of California has been curtailing 15 per cent, approximately one seventh, for several weeks.

Union Oil Co. will adopt the recommended reduction though it is reported to have been increasing its refinery operations the last four months, intending to store refined petroleum products instead of crude and storing fuel oil in low cost earthen storage.

Small Independent refiners in California lately have been forced to curtail because they are cramped for storage. This curtailment, however, is only temporary. A large buying group which had been taking 12,500,000 gallons of gasoline monthly from some Independent refineries has reduced the amount to 7,000,000 gallons. About 125,000 gallons a day of the 5,500,000 gallons released has been turned into the California tank car market and is threatening it.

The policy of the Standard of New York is seen in a statement issued by its subsidiary Magnolia Petroleum Co.:

"While it is practically impossible for refining and drilling operations to cease entirely on Sunday, Magnolia Petroleum Co., responding to the existing situation in the oil industry, as

has been pointed out by the Federal Oil Conservation Board, will curtail its Sunday operations in its refineries and drilling insofar as may be practically possible, and limit such operations through the balance of the week so that its operations throughout the whole week will be practically on the basis of a six-day week."

When this statement was issued in Dallas, an inspection party of the New York company at Fort Worth included Herbert L. Pratt, chairman; C. F. Meyer, president; Arthur F. Corwin, production vice-president, and E. R. Brown, president of Magnolia.

In New York, Axtel J. Byles, president of the Tide Water Associated Oil Co., which operates on the Atlantic and Pacific seaboards and in the Mid-Continent, said the organization was making plans to put the curtailment into effect.

J. C. Van Eck, president of the Shell Union Oil Corp., in New York confirmed the California report by saying the California Shell subsidiary would make the suggested curtailment apply to production as well as to refinery throughput. Shell companies in the Middle West and Mid-Continent were considering the proposal, he said.

H. F. Sinclair, chairman of the Sinclair Consolidated Oil Corp., said March 8:

"In accord with the spirit of conservation, Sinclair Consolidated Oil Corp. has not only curtailed its drilling operations and production of crude oil, but has also greatly reduced its refinery runs.

"In former years, we normally built up large stocks of gasoline during the winter months. Today as a result of the reduction of refinery operations put into effect several months ago, our storage supply of gasoline is only what is necessary to meet day to day requirements. In other words, anticipating present conditions, we have for months put into practical application the policy of curtailment now advocated by the Federal Oil Conservation Board."

Roy B. Jones, president of the Panhandle Producing & Refining Co., Wichita Falls, Texas, and president of the Western Petroleum Refiners Association, said that to make the curtailment plan operative it would be necessary for the conservation board to canvass the refining division and get pledges of co-operation and promulgate the results of its canvass to the industry and to set an effective date. He added that his company was willing to participate in any feasible plan.

Mr. Jones considered a shutdown as impractical as did other refining company executives in the Mid-Continent.

Although The Texas Co. issued no statement concerning the curtailment suggestion, R. C. Holmes, president, gives the company's conception in an article prepared for the March issue of the Texaco Star, the company's own monthly.

"Any attempt to check the situation through regulation of refinery runs of gasoline stocks would appear to lead into almost unsurmountable technical and legal difficulties, whereas each state can deal with production within its own borders."

Mr. Holmes discusses the production situation, saying we are in a period of chronic overproduction of crude oil which is different from any other overproduction situation where oversupply has brought price conditions that discouraged new activities in a comparatively short time.

Asked regarding the probable cost to the refiner and producer of instituting the cut, one refiner in New York said, "We are losing, we are going to lose in any case; it is not a matter of what we may lose right now, but of getting the entire industry in a healthy condition so that the loss will not continue over an indefinite period, which will be the case if stocks are permitted to mount up until, as at present, the market price is below the cost of refining.

"It will be better to take a certain loss now with the result of materially reducing the excess stocks existing, and get the industry on a proper footing, than to continue piling up gasoline and crude for which no market exists, thereby continuing and aggravating the situation. The oil industry now has an opportunity to correct the existing evil of overproduction in field and plant which, if not taken advantage of, will continue to demoralize the market, with no substantial relief in sight."

Wilbur Drafts Committee To Analyze Demand

By Telegraph

WASHINGTON, March 10

IN FURTHERANCE of his plan to have the governors of states persuade refiners to curtail gasoline production, Secretary Wilbur, as chairman of the Federal Oil Conservation Board, March 11, set to work a committee of five to make an unprejudiced analysis of the status of petroleum demand. The five are J. Elmer Thomas, Fort Worth, Tex.; Joseph E. Pogue, New York; H. W. Lowrie, Jr., Denver, Colo.; Ray E. Collins, Tulsa, Okla., and H. P. Grimm, Los Angeles.

The secretary announced his newest move on March 10 as if he had just made the proposal. As a matter of fact he had lined up his committee, brought its members to Washington and had everything ready for the committee to begin its work the next day.

Mr. Thomas is chairman and Dr. Pogue is secretary of the committee. Dr. Wilbur called attention to the fact that Messrs. Collins and Grimm were umpires of production for Oklahoma and California respectively, the announcement, exclusive of the paragraph giving the names follows:

"The Secretary of the Interior, as chairman of the Federal Oil Conservation Board, today put into motion machinery for a complete and unprejudiced analysis of the status of petroleum demand and consumption for the year 1930. In a letter to five nationally recognized authorities on petroleum matters, Secretary Wilbur asked that they constitute themselves a committee on petroleum economics, make a study and report their findings to the Federal Oil Conservation Board."

In his letter to the members of the committee Secretary Wilbur said:

"In performing its function of advising the oil industry and the public, the Federal Oil Conservation Board needs and unprejudiced analysis of the status of petroleum demand. To that end I desire to ask the services of a group of distinguished students of practical economics in making a brief review of the outlook for 1930, utilizing the best statistics available, and reporting its findings to the Federal Oil Conservation Board.

"Two questions present themselves: The first of these is what is the anticipated consumption of refined products? The second is what amount of crude is necessary to meet efficiently that demand?

"This service solicited from you is in the broader interests of true conservation of a resource in which there is a most active interest."

Dr. Wilbur, before the committee was appointed, had assembled figures the committee would need, particularly showing that refining processes, in the last ten years, had improved so much that the country's need of gasoline could be met by the refining of much less crude than had been run to stills. One outstanding fact, to his mind, was that one barrel of crude in 1929 yielded as much gasoline, approximately 16.5 gallons, as a barrel and a half yielded in 1919.

His thought is that the board should be able to show the industry and the country that curtailment was indicated as a necessity unless it could be shown that the probable demand was much greater than claimed even by the most optimistic person. The committee is expected to complete its analysis with all speed consistent with careful work.

Standard of Indiana Announces New Line of Motor Oils

By J. C. Chatfield
N. P. N. STAFF WRITER

BY THE time readers of NATIONAL PETROLEUM NEWS see this page the Standard Oil Co. of Indiana will have announced a new line of motor oils in a feature radio program covering its marketing territory. The radio program is to be broadcast on the evening of Mar. 12 and the new oils will be offered for sale at all Standard stations on Mar. 13.

The Standard Oil Co. of Nebraska also will sell the new oils beginning on the same date. Midwest Refining Co. will sell the products in the Rocky Mountain area but will not be stocked at all points before April 15.

Although the oils are new they will carry the same brand names which have been used in the past. There will be a complete line of Polarine motor oils and a line of Iso-Vis, prediluted oils. No advance is to be made in the price.

A feature of the new oils will be their color. The oils have a clear amber color, quite unlike the dark green oils which have been sold in the past. Colors range from 2½ to 4 N.P.A.

The color characteristics of the oil result from the fact that all grades are 100 per cent overhead stock and are highly treated. No residual stock is blended with lighter distillates to produce the finished motor oils. The company went to the overhead method to produce oils which, when used in an automobile engine, would give a low carbon deposit and resist oxidation in the crankcase.

Technologists of the company determined from their study that there are four essential properties of motor oils which determine efficiency in the motor. They are:

1. Viscosity temperature characteristics.
2. Pour test.
3. Tendency to deposit engine carbon.
4. Stability in the crankcase.

The company's research work was directed toward the production of oils which would have the best possible characteristics which could be obtained under each of the properties named without sacrificing elsewhere. In other words oils were sought which would not be good at some points at the expense of others.

S.A.E. viscosity numbers have been adopted by the company in connection with the new oils. Each grade will contain a viscosity number as a part of the name, for example, Polarine 60 takes the place of Polarine Extra Heavy and Polarine 50 takes the place of Polarine Special Heavy.

Except for Polarine 20, which is essentially a winter oil, the viscosity of all grades has been raised to the highest possible point within the Society of Automotive Engineers specifications. Polarine 20 is said to have a viscosity of 135 to 140 seconds at 130 F. This grade has a pour test below zero.

IN HIS first radio appearance for an oil company Will Rogers American humorist from the oil country of Oklahoma, helped introduce the new line of motor oils offered by the Standard Oil Co. of Indiana through a hook-up of mid-western radio stations March 12. Other notables on the program over the 15 radio stations were Louise Homer and Sousa's band.

The following viscosities are reported to be about those which will be found in the various grades of Polarine:

Grade	Seconds	Degrees F.
Polarine 10	105-110	130
Polarine 20	135-140	130
Polarine 30	250-255	130
Polarine 40	70-75	210
Polarine 50	90-95	210
Polarine 60	115-120	210

In the case of the Iso-Vis line of oils the viscosity numbers are those of the base oil before adding the diluent. For that reason the company will recommend oils one grade heavier in Iso-Vis than for Polarine. A car taking an S.A.E. No. 30 oil will be supplied with Iso-Vis 40.

The Iso-Vis line of oils includes five grades ranging in viscosity number from 20 to 60.

Wax removal from the new oils has been carried to the extent that all grades will have a low pour test. Except that the Polarine 20 has a pour test below zero the detailed tests have not been revealed.

A large number of road tests have been made by the company to determine relative oil consumption between old and new grades. In a Model A Ford 42 tests were run averaging more than 1000 miles per test on Iso-Vis 50 oil compared with Iso-Vis Heavy, the former oil. It was found that the new grade gave an average of 512 miles per quart as compared with 443 miles for the old oil.

Polarine 40 in 47 tests averaging 895 miles per test showed an oil consumption of 496 miles per quart as compared with 420 miles per quart for Polarine Heavy.

In four tests in a G.M.C. truck the new Polarine 50 was consumed at the rate of 1 quart for each 850 miles as compared with 1 quart in 702 miles of Polarine Special Heavy. In all 38 truck tests were made on Iso-Vis 60 averaging 535 miles per test with a reported consumption of 1 quart to 213 miles. This compared with 38 tests averaging 520 miles on the old Iso-Vis Extra Heavy which showed a consumption of 1 quart to 191 miles.

The Standard radio program of Mar. 12 was scheduled to feature Will Rogers, Louise Homer and Sousa's band. The broadcast was to be from 9:30 to 10:30 p.m. from 15 stations.

"Bob" Choate, Doherty Official, Is Dead

CLEVELAND, March 10.—The body of Robert R. Choate for more than 25 years affiliated with the Cities Service Co., was buried Feb. 26 at Gettysburg, O., his birthplace. Mr. Choate died of pneumonia in New York Feb. 19. He was 46 years old.

After being graduated from Ohio State university in 1904, Mr. Choate entered the employ of the Denver Gas & Electric Co. as a salesman. He held various positions with Cities Service public utilities until 1917 when he was made vice-president and general manager of the Crew Levick Co. of Philadelphia.

In 1928 Mr. Choate was transferred to the New York headquarters of the Cities Service Co. as an executive in the refining and marketing division.

He was a widower and left a son and two daughters, his mother, and three sisters.

Franklin Relates the Tariff Drive To Senate Committee

By A. E. Heiss
N. P. N. STAFF WRITER

WASHINGTON, March 10

ALMOST immediately after the amendment offered by Senator Thomas placing petroleum and its products on the dutiable list of the tariff was defeated, conditions began improving—from the point of view of the independent producers.

The coalition of oil, sugar and lumber on which they had worked and based their hopes seemed to be showing steam roller characteristics, even though it had failed the oil operators.

What the oil men had hoped would be accomplished when the vote was taken on petroleum came about when duties on sugar were increased March 5. For three days thereafter the coalition that had had control of the tariff bill for six months was hammered and defeated on every test vote.

Unhorsing of the coalition set the political writers to work on something definite, for the writing into the tariff bill of higher rates on sugar meant to them a real revolution in the Senate. Big refiners of sugar, like big refiners of petroleum, favor low or no duties on sugar, while the growers of cane and beets, like many producers of petroleum, favor duties. Commenting on the situation produced by the upsetting of the old coalition, the conservative Evening Star of Washington said:

"Unless the coalition regains its old strength, or a great deal of it, the Senate is likely to levy a duty on lumber, may even adopt a duty on oil, and may restore the old duties on aluminum. The coalition leaders have been shouting 'logrolling' and 'trading votes' in criticism of the new combination. But that has not tended to sweeten the tempers of those Senators who broke away from the coalition to vote for the sugar and cement duties. The new combination contains a considerable number of Democrats, as well as some of the Republican insurgents who have hitherto been members of the coalition. The more success attending the efforts of the combination, the stronger it grows, and it appears that if it is to be halted by the coalition, the latter must act quickly."

When Wirt Franklin, the leader of the independent operators fighting for a tariff on petroleum products, appeared on the witness stand of the Senate lobby investigating committee March 4, in answer to a summons of the committee, he had a statement already prepared in answer to the speech Senator Blaine, of Wisconsin, made about the proceedings of the lobby committee during the debate on the Thomas amendment.

The committee refused to allow Mr. Franklin to present the statement unless he first permitted the committee to inspect it in advance of its delivery. This Mr. Franklin refused to do.

Senator Thomas, of Oklahoma, announced before the lobby investigating committee March 4 that he would renew the fight to secure a duty on crude and refined products when the Senate took the fictional step of coming out of a committee of the whole and going into a session of the Senate.

In a way, the session of the lobby committee March 4 was a counter attack by Mr. Franklin upon Senator Blaine. Refusal of the committee to permit Mr. Franklin to make a statement forced him to seek other means to get before the committee statements in answer to observations made by the senator from Wisconsin.

Senator Thomas announced that he would read the statement to the Senate in connection with his remarks in behalf of a tariff when the bill came before the Senate sitting as a Senate and not as a committee of the whole Senate.

Senator Blaine subjected Mr. Franklin to an examination on various phases of the effort of the independent producers to obtain a tariff on petroleum and its products at the March 4 meeting of the committee. Those who attended both hearings believed that they saw a difference in the attitude of the Wisconsin senator at the second meeting. At the first hearing he was almost savage at times in his asking questions. He appeared much milder at the second hearing.

Answering Senator Blaine, Mr. Franklin related the story of the calling of the Tulsa meeting and of the coming to Washington of the independents. He said that he had never heard that the Dancigers had proposed to subscribe $100,000 to aid the tariff fight. He said that Joe Danciger, in Tulsa, subscribed $5000, paid it, and said that he would give a much larger sum to aid in pulling the industry out of its deplorable condition. Senator Blaine asked Mr. Franklin if he knew Tom Cranfill, and, after having found out that Mr. Franklin did know him, he asked: "Did you hear that he would raise $300,000 to put through an oil tariff?"

"We would be glad to hear it," answered Franklin.

"Do you know it?" pressed Senator Blaine.

"No, do you?" countered the witness.

"No, but we may learn," retorted Senator Blaine.

"Did not Eugene Lorton, of Tulsa, refuse to join the association, because it was promoted by promoters, lessees and blue sky salesmen?" continued Senator Blaine.

"I know to the contrary, that it is composed of producers who have felt the pinch," replied the witness.

Asked about Mid-Continent oil men who were reported by Mr. Franklin to be in favor of a tariff but had not openly come out for it, Mr. Franklin retorted to Senator Blaine:

"If you had been in the business of producing oil and knew that the powerful influence of the large oil companies had been responsible for cutting off your credit and if you knew about the oil business, you would not be on the side of the case you are."

Senator Blaine wanted to know about the "powerful influences," but Mr. Franklin said there was no direct evidence, but only inferences drawn from actions.

Second Vote Indicated

By Telegraph

Washington, March 11.—The death of William Howard Taft put a check upon tariff fighting in the Senate, which, due to the overthrow of the coalition of irregular republicans and democrats, indicated another vote on the proposal to put petroleum and its products on the dutiable list. In such a second vote the chances of the Mid-Continent producers were believed to be much better than when the vote was taken Feb. 28.

Senator Blaine, The Liar

AMERICAN business has suffered much from the tongues of the "wild asses" from the west who happen to be in the United States Senate, but there has hardly ever been a more cowardly, unfair, lying attack on a group of business men than that made by Senator Blaine, of Wisconsin, on Wirt Franklin and his associates in the oil tariff campaign.

One should not hesitate to call Blaine just exactly what he is, even though the language is rough, a cowardly liar. A senator is no more protected by his senatorial office from punishment for his misbehaviour than any other citizen. He, more than any one else because he is supposed to be a leader, should have every regard for decency, fair play and truth telling. Yet Blaine, LaFollette, Brookhart and some of their associates seem to feel that they are above all rules and laws governing mankind and this country.

There is just one thing to do and that is to fight back in plain, vigorous fashion and at every opportunity. Wirt Franklin submitted a virile, manly statement to the senate committee, which, because it proved Blaine to be a liar, the committee cowardly refused to receive. Senator Thomas, from Oklahoma, will present it on the floor of the senate and we hope he asks that Blaine be called to the bar of the senate and be censured for his deliberate lying. Unless the senate will police the loose tongues and evil minds of its own members it cannot expect the general public to have any respect for it.—W.C.P.

"Who cut off your credit?" asked Senator Blaine.

"It has not been done yet, but I'm looking for it," replied Mr. Franklin.

Senator Walsh of Montana interrupted to say that, if these things were true, it was the duty of the committee to find it out. Mr. Franklin replied that it was evidence hard to obtain, nevertheless the fear existed. Some of the independents, he said, had contributed to the fight without joining the association. He added that it was generally known among the oil fraternity that if one looked for credit in New York and the Standard Oil said "no" that that ended it. He said it was a settled conviction with the oil men, more than knowledge from indirect evidence.

At several points in the committee hearing, Mr. Franklin was able to bring in observations with regard to proposed methods of fighting for a tariff had been made to the delegation by ill-advised friends. He said that the telegram from F. E. Tucker, executive secretary of the association, about the rumor that President Hoover was a large stockholder in companies having South American oil productions was not a hostile move, but evidence of the solicitude felt for President Hoover by Mr. Tucker who, he said, was one of the most ardent Hoover men in the whole country. Mr. Franklin said that he thought that paying attention to the rumors and the reports would be to dignify them and make them appear to have an importance which they did not have. Mr. Franklin said that the reports about the special trains of the delegations were largely newspaper efforts to make a good story.

The witness evoked a smile at the expense of Senator Blaine by explaining that it was not Senator Blaine's language that had driven him (Franklin) from the Senate gallery on the night of the oil debate, but a telephone call from Los Angeles, suggesting that California might help by sending a delegation, of considerable size, to Washington. The witness said that he had advised the Californians not to come. He said that he had given like advice to several groups of mid-continent producers.

In addition to refusing to hire lobbyists in Washington, Mr. Franklin said he had refused to confer with the American Federation of Labor, as telegrams seized by the committee had suggested. In answer to Senator Walsh as to why he refused, Mr. Franklin said that the oil field labor was not affiliated with the Federation and also that the fight was on behalf of farmers and those interested in production. Oil field labor, the highest paid in the country, Mr. Franklin said, was not organized.

The committee thought it had found something worth while when it dug up a telegram from Earle Calloway of Amarillo, Texas, sent from Washington to Tex McIlroy of the Dixon Creek company, which read: "If you want to know something, this is a hell of a fight. Some of you oil field workers think a 24-inch bit is a tough proposition, but compared with the United States Senate it is a feather bed. We are making headway. Keep the folks in line."

The witness said that the telegram was from one Irishman to another, adding to Senator Blaine, "if you knew anything about the oil business you would know that a 24-inch bit is the largest tool used in the oil field."

Russell Brown, who had done the secretarial work for the delegation, by way of answer to stories that the delegation had been spending about $2000 a day, submitted paid bills showing that, to March 4, the delegation has spent about $3800 for rooms and board at the Mayflower Hotel, stenographic services, telegrams and telephone messages or about $200 a day instead of the $2000 mentioned in newspaper reports.

Kentucky Independent Co. To Sell Out to Shell

CLEVELAND, March 11.—The Kentucky Independent Oil Co., Covington, Ky., will take final action this week in selling its assets to the Shell Petroleum Corp. W. F. Burke, secretary, has advised NATIONAL PETROLEUM NEWS that action on the directors' decision to sell to Shell will be taken at a stockholders meeting March 12.

The Kentucky Independent company operates 32 service stations, two bulk plants and has about 50 dealer accounts in the Cincinnati territory. The company was organized in 1907.

Mr. Burke, well-known throughout Ohio and prominent in the Ohio Petroleum Marketers Association, is considering several propositions for the future, but has made no decision. He has been connected with the oil industry for about 23 years.

Shell Acquires 8 Stations In Washington

WASHINGTON, D. C., March 10.—Shell Eastern Petroleum Products, Inc., has acquired eight service stations in the Washington area and is negotiating for other stations. These purchases have been of established stations.

D. E. Deane, a Shell employee, who has been stationed in other cities, is in charge of building up outlets in the national capital.

Acquisition of stations has been going on since the middle of February. Inability of the company to make a satisfactory arrangement for taking over the stations of the Penn Oil Co., of which Paul Himmelfarb, one of the early marketers of benzol blend in this part of the country, is the head, delayed the entry of the Shell, it is understood.

At one time, late in January, it was thought that the arrangements had been completed for the transfer of the Himmelfarb properties to the Shell interest. So nearly was the transfer complete that a parade of Shell trucks and other equipment, radiant with the red and yellow of the Shell, through the principal down town streets took place. The transfer was expected to take place on February 3 but Mr. Himmelfarb said that the negotiations had not resulted satisfactorily.

Quoting Tank Car Gasoline on Delivered Basis Discussed in Mid-Continent

By J. C. Chatfield
N. P. N. STAFF WRITER

By Telegraph
SHREVEPORT, La., March 10

MARKETING problems of inland southwestern refiners occupied the attention of the Western Petroleum Refiners Association at its annual meeting starting here today.

Discussion centered around the new method of basing retail prices which has been adopted by some of the major companies—particularly along the Atlantic seaboard—which is that of fixing retail prices on the cost of gasoline at the seaboard plus freight and handling costs to destination.

As pointed out by President Roy B. Jones, in his annual address, Group 3 has had a one-price policy in the past. The Group 3 price has been a single price for any destination, without reference to the freight cost to the point where the gasoline was to be sold.

In the general Mid-Continent section Kansas has had a special price applying to differential territory and the north Louisiana and Arkansas refiners have sold on one basis in those two states and in Mississippi. Outside of these limited differential territories all refiners in the Mid-Continent have sold f.o.b. Group 3.

General opinion at the meeting was that sooner or later the cost at refinery plus transportation method of fixing retail gasoline prices will be adopted by other major companies. The retail prices in the middle west thus may be based on costs from a large number of refining points, gasoline pipe line stations or seaboard terminals and hence be exceedingly complicated.

The thought was advanced that gasoline should be sold on a delivered basis from Mid-Continent refineries, the delivered price being arrived at after considering freight costs from refinery to destination and the price of competing refiners quoting in the destination area.

It was pointed out that central states refiners now have this policy. They quote a delivered price at destination based on the open market price in Group 3, plus transportation to the buyer and ship from the most convenient point.

Last year the marketing territory open to Mid-Continent refiners was reduced as other competing groups found it possible to invade edges of the territory. And under the one price policy the Mid-Continent refiners were not able to meet competition in outlying sections without reducing prices over their entire territory. Several refiners expressed the opinion that delivered prices might have enabled them to retain at least a part of this business without cutting prices on their entire output.

Something over a year ago it was said that California gasoline invaded some parts of Iowa. In order to meet the California competition on a one price policy it would have been necessary to cut prices in such states as North and South Dakota where California gasoline could not possibly enter.

One difficulty suggested in the tank car markets is that there is no outstanding price leader for the smaller manufacturers to follow, while in the retail markets there is a leader in every part of the country with such a large share of the business that its prices are followed more or less closely by other marketing companies.

No conclusion was reached by the association in its discussion of gasoline specifications. President Jones advanced the idea that perhaps the association should seek to devise a group of specifications in terms of motor car performance which would mean something to jobber, retailer and motorist alike. In the past the association has felt it more expedient to refrain from specification making, since many states require U. S. Motor specifications.

General thought at the meeting today was that the tendency is for refiners to make and sell better and better gasolines and that the race for business is such that retailers are selling better and better grades at the U. S. Motor price. As long as the overproduction continues the tendency may continue also it was stated.

P. F. Gwynn reported to the association on the activity of the export committee of the western refiners' association. which has been working with the Export Petroleum Association. He showed that the association has provided an outlet for a considerable volume of gasoline for overseas shipment, particularly in times of distress.

On Mr. Gwynn's recommendation the refiners association will appoint a strong committee for the next year with instructions to keep in close touch with export conditions through the export association and to seek an adequate export outlet for Mid-Continent gasoline.

Houston Dunn, of the National Petroleum Mutual Fire Insurance Co., Philadelphia, suggested to the refiners that they organize an association of

New Officers and Directors Of Western Refiners

LLOYD R. CRAWFORD, president of the Producers and Refiners Corp., Independence, Kansas, was elected president for the coming year. Vice presidents elected were M. J. Grogan, president of the Louisiana Oil Refining Corp., Shreveport, representing the Louisiana-Arkansas group; George D. Locke, vice president of the Barnsdall Refineries, Inc., Chicago, representing Oklahoma and Kansas; and E. H. Eddleman, American Refining Properties, Wichita Falls, representing the Texas group.

Directors elected are H. T. Ashton, Lubrite Refining Co.; T. M. Maring, Lion Oil & Refining Co.; Sheldon Clark, Sinclair Refining Co.; O. L. Cordell, Independent Oil & Gas Co.; F. W. Burford, Burford Oil Co.; A. L. Derby, Derby Oil Co.; T. T. Eason, Eason Oil Co., John L. Gray, Shaffer Oil & Refining Co.; D. P. Hamilton, Root Refineries Inc.; C. L. Henderson, Vickers Petroleum Co.; R. R. Irwin, White Eagle Oil & Refining Co.; E. J. Marsden, Texas Pacific Coal & Oil Co.; L. B. McCammon, Transcontinental Oil Co.; E. S. Karstedt, Continental Oil Co.; H. A. Trower, Phillips Petroleum Co.; P. F. Gwynn, Iowa Park Producing & Refining Co.; F. R. Snyder, Simms Oil Co.; E. L. Miller, Shell Petroleum Corp.; L. H. Prichard, Anderson Prichard Oil Corp.; and C. C. Smithers, Indian Refining Co.

Past presidents of the association will serve as members of the board.

fire marshals on the plan which has been followed so successfully by the National Petroleum Association in eastern refineries, with meetings of the marshals and reports to each other of all fires and their causes, as well as frequent cooperative plant checks, Mr. Dunn expressed the belief that fire losses could be cut. He told the refiners of the work which the Mutual company has done, saying that last year inspectors made more than 400 recommendations for correction of conditions at oil properties, all of which were such as not to come within the fire bans of the stock insurance companies, but which might cause fire.

Retiring President Jones was presented with a beautiful silver service and an antique desk for his office. Fayette B. Dow, Washington counsel for the refiners, officiated in the presentation. Prior to bringing in the silver service he humorously prepared Mr. Jones for retirement by presenting him with a pair of pajamas, slippers and a hot water bottle.

Aluminum Tank and Semi-Trailer To Be Given Hill Tests

CLEVELAND, March 10

TESTS of the first all aluminum alloy semi-trailer with aluminum alloy tank for the hauling of gasoline, will be conducted at Gates Mills, O., about 18 miles east of Cleveland, March 18 beginning at 10:30 a.m. The tests of aluminum equipment in comparison with steel tank and steel semi-trailer will be conducted under the auspices of the National Refining Co., Cleveland, and directed by S. A. White, purchasing agent of the National.

The tests will be similar to those run last spring when the 750-gallon and 1000-gallon semi-trailer tank jobs were being introduced in the oil industry. At that time the motive of the tests was to ascertain the pulling ability of various truck tractors.

This year the primary motive will be the gathering of data on the time and power savings which the lighter weight aluminum jobs will permit.

A secondary motive will be to see what the power units of various manufactures will do. Since last year's tests most manufacturers have redesigned their truck tractors to fit into the transportation scheme centering around semi-trailer jobs.

The aluminum alloy trailer that will be used in the test, was built by the Fruehauff Trailer Co., Detroit, and the tank by the Davis Welding & Mfg. Co., Cincinnati. Engineers of the Aluminum Co. of America, Pittsburgh, cooperated with both companies.

The steel tank and semi-trailer which will be used to compare with the aluminum job, were built by the same companies and have been in the service of the National Refining Co. the last year.

In this year's tests the aluminum and steel jobs will be hauled up the Cedar Road hill at Gates Mills by truck tractors of at least nine makes. So far tractors have been entered by Ford, Reo, Dodge, Autocar, GMC, White, Mack, Brockway-Indiana, and International. Two or three other makes may be entered before March 18.

The new semi-trailer has steel in only the springs, spring hangars, and rear axles. The fifth wheel and frame are of aluminum alloy and the wheels are of cast aluminum. The aluminum job is 2600 pounds lighter than the steel job with which it will compete.

Both jobs will have 750-gallon tanks and the payloads will be the same. The main hill where the tests will be made is 3700 feet long with grades ranging from 2½ to 12½ per cent. This hill has brick pavement. Tests may also be run on a 965-foot hill on the dirt Chagrin River road which intersects the paved hill at its base. This hill has grades ranging up to 15 per cent and is winding.

The same method of testing used last year will again be employed. The two hills were marked at 100-foot intervals and the speed, time and transmission gear used will be charted at the 100-foot intervals.

In addition to showing the expected higher speed at which the aluminum job may be hauled up the hills with full payload, the motor transportation officials of many oil companies will be given an opportunity to see what the redesigned automotive equipment will do under the same road and load conditions.

It is expected that transportation men and purchasing agents will attend from the Standard Oil Cos. of New Jersey, New York and Ohio, The Texas Co., Vacuum Oil Co., Gulf Refining Co., Shell Petroleum Corp., Pure Oil Co., Crew Levick Co. and others.

Besides the oil industry representatives, engineers and sales executives of truck trailer and tank manufacturers and the Aluminum Co. will be present.

The National Refining Co. has arranged for the out-of-town men to meet at room 1028 Hotel Hollenden, Cleveland, and go to Gates Mills in busses.

Special Cars for Meeting

TULSA—Two special cars left Tulsa March 9 for the annual convention of the Western Petroleum Refiners Association at Shreveport, March 10, 11 and 12.

American Petroleum Institute report of refinery operations in the United States for the week ended Mar. 8, compared with the week ended Mar. 1

Districts	Per Cent of Capacity Reporting	Daily Av. Crude Run to Stills Wk. Ended Mar. 8 (Barrels)	Daily Av. Crude Run to Stills Wk. Ended Mar. 1 (Barrels)	Per Cent of Reporting Capacity Operated Wk. Ended Mar. 8	Per Cent of Reporting Capacity Operated Wk. Ended Mar. 1	Stocks Reported in Thousands of Barrels: Gasoline Stocks Mar. 8	Gasoline Stocks Mar. 1	Gas & Fuel Oil Stocks Mar. 8	Gas & Fuel Oil Stocks Mar. 1
East Coast	100.0	473,700	487,500	78.2	80.5	8,520	8,433	6,353	6,391
Appalachian	91.0	90,300	82,900	77.4	71.1	1,794	1,679	671	677
Ind.-Ill.-Ky	98.6	296,900	303,900	83.6	85.6	7,861	7,804	2,895	3,000
Okla.-Kan.-Mo	89.1	276,500	271,200	67.2	65.9	4,707	4,698	3,338	3,222
Texas	90.8	587,700	604,700	82.1	85.7	8,377	8,097	11,727	12,006
La.-Ark	96.8	166,700	185,800	63.6	70.9	2,608	2,686	2,103	2,092
Rocky Mountain	93.6	47,900	55,300	34.4	39.7	2,896	2,925	1,058	1,042
California	99.3	593,000	608,800	66.5	68.3	16,369	15,868	109,324	109,781
Total U. S.	95.5	2,532,700	2,600,100	72.4	74.6	53,132	52,190	137,469	138,211
Texas (Gulf Coast)	100.0	457,400	466,500	86.9	88.6	7,183	6,919	9,047	9,365
La. (Gulf Coast)	100.0	106,900	116,800	72.5	79.2	2,287	2,353	1,276	1,261

U. S. Motor Gasoline Loses Importance

Present Specifications Are Inadequate as a Measure of Gasoline Quality. New Specifications Based on Motor Performance and Equally Intelligible to Jobbers and Consumers Suggested

By Roy B. Jones*

(Presented before Western Petroleum Refiners Association, Shreveport, March 10)

THE oversupply of gasoline in 1929 was the greatest in the history of our industry, Mr. Jones points out in his annual address as president of the Western Petroleum Refiners association which is published herewith in part. Stocks increased 10 million barrels as compared with an average increase of 2 million barrels in previous years.

Increased business no longer indicates added welfare of the company obtaining the business, he observes, since it must be gained without adequate profit.

Open market sales are important to all refiners, whether selling in the market or not, since the open market price has a wide influence on contracts, margins of resellers and the retail price. The small open market established by near-bankrupt refiners should indicate to stronger companies that they should sell in this market for their own protection.—Editor.

ONE great problem largely responsible for the failure of gasoline to properly contribute to our welfare is of course, overproduction of the product. There is probably little I can say in this regard that would not be simply a repetition of things we have all often thought, often hear, and often read.

There is but one proper measure for gasoline production. Demand within the profitable market.

Last year the disparity between gasoline production and demand was by far the greatest in the entire history of refining. With an adequate working supply on hand the combined refineries of the country added 10 million barrels to their stored supply to intensify sales desires and add to future costs. While, with increased volume of business, an increased inventory is to be expected, the stock addition of 1929 exceeded the bounds of reason.

The magnitude of this increase can be appreciated if we consider that during the preceding eleven years—all of the years for which we have the Government statistics—the average annual increase in gasoline stocks was but slightly in excess of two million barrels. A discouraging feature of this excess of production of ten million barrels was that it occurred during a year when demand was good and even greater than the majority of the early estimates.

1929 History—Production up 15%; Shipments up 12¼%; Stocks up 30%

Briefly stated, the experience of 1929 consisted of a 15 per cent increase over the preceding year in gasoline production in conjunction with a 12½ per cent increase in refinery shipments and a resultant increase of 30 per cent in stocks. While the increase of the heretofore unapproached quantity of 10,000,000 barrels represented less than 2½ per cent of the year's gasoline production, it was sufficient to destroy all opportunity for reasonable profit from refinery operations. That 2½ per cent, small as it may appear when thus expressed, represents a narrow margin that largely decided the issue between success and failure.

Few manufactured commodities are as neccessary as gasoline. Despite this fact, gasoline production carried to excess, from being a virtue becomes a vice. Our cars of gasoline are like the aces in a game of cards. Where four may be admired and quite correct, the intrusion of a fifth leads only to trouble, suspicion, hatred, and immediate turmoil.

With the effect of excessive gasoline, regardless of in whose hand, so widely known it is difficult to realize just why individual plants, and groups of plants, should carry zeal for manufacture to a state that infringes the rules of the game of business. Possibly such actions are not the result of refiners judgment but simply a response to the dictates of some hidden power over which refiners have no control. If this is true a better relationship and understanding between crude producers and refiners is a vital problem in our affairs. All branches of the industry should appreciate that there is a definite limit to the consuming ability of every market.

While California has been rightly blamed for much of the disaster experienced in 1929 over-production of gasoline was the rule at practically all refining groups. California made 6,000,000 barrels, the Mid-Continent 1,100,000 barrels, and all other groups of plants 2,900,000 barrels in excess of sales. Stock increases alone, however, are an insufficient index to the situation.

Any plant or group of plants can manufacture far beyond advisable limits and by virtue of relative price reduce its stocks to the detriment of its competition. A comparison of increases in volume of shipments for the different groups is most illuminating with respect to competition between refining groups.

If we compare the gasoline shipments for the country as a whole in 1929 with those of 1928 it will be found there was substantial increase of 12½ per cent as previously mentioned. For the individual groups the Bureau of Mines reports approximately the following changes in refinery shipments:

East Coast	8% Inc.
Appalachian	1% Inc.
Ind.-Ill.-Ky.	19% Inc.
Oklahoma-Kansas	3% Inc.
Inland Texas	21% Inc.
Arkansas-Inland Louisiana	28% Inc.
Texas Gulf	11% Inc.
Louisiana Gulf	17% Inc.
Rocky Mountain	5% Dec.
California	22% Inc.

As constant changes affect the markets of various groups, it would be most illogical to expect uniformity of increase. The divergence in these percentage is so pronounced, however, that it requires but little imagination to conclude differences in quality of product, sales ability, and advantage of plant location or raw material

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Roy B. Jones

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were overshadowed by some more powerful factor, such as relative price, in 1929.

Competition between the groups in search for gallonage has reached a point where increased business is no longer an indication of added welfare. In my opinion, neither sound law nor good business judgment requires or suggests that competition should be carried to a point where goods are sold without adequate profit or at an actual loss, not merely to the least efficient, but to everyone concerned.

Unquestionably competition should be maintained between individual plants and groups of plants. Nothing I have said is intended to oppose wholesome and legitimate competition within the limits of a living profit to competent plants. Nor do I infer that any group is intentionally taking losses to injure others. I do wish to impress the thought, however, that group competition is extended beyond the pale of reason. Possibly the logical solution to such a problem is a more universal economic education within our industry.

Some very close estimates were made with respect to 1929 demand. However, regardless of whatever degree of error existed in any early calculations, all refiners and all refining groups had sufficient data to revise and improve their estimates as the year progressed. Back in the old days when refiners had restricted sources of information at their command there was a real excuse for error. At the present time, however, with weekly and monthly reports at hand there is but slight reason for conditions such as those of the year just ended.

Price depressions increase both the variety and number of our problems. There is a much greater stability between the price of crude and gasoline at retail than between crude and the price of gasoline in the open tank car market. In consequence, the wide margins beyond the refinery, that invariably exist when refiners' profits are reduced by price, lead to many ills. Not theory but practical experience has often shown that when the open tank car market price at refineries affords too great a spread in comparison with the price to consumers, this wide margin provides a field for secret rebates, encourages an enlargement of an already overbuilt system of distribution, leads to discounts, and unethical practices of distribution.

While the code of ethics so widely endorsed throughout the industry in 1929 may be expected to gradually mitigate the evils of unreasonable margins a much more effective remedy would be the elimination of the excessive margin by the maintenance of a profitable refinery price.

The open market for our product is one of our greatest problems. In this connection I would like to quote the following from one of the reports of our marketing committee:—

"It seems probable that many refiners must have a distorted conception of the ultimate effect of their transactions or an inadequate idea of the importance of the open market. In reality the open market has an importance in no way comparable to its actual size.

"Those who sell on such a market are naturally directly affected by its prices; those who sell on contract are, indirectly, but little less immune from its influence on their profits; while even those who sell through stations might well bear in mind the price-wars and increased competition made possible by its all too frequent periods of depression and again recall the drastic reductions in service station prices that occurred when integrated price posters lost faith in the ability of refiners to maintain the tank car price at a profitable level.

"It has often been said that a very few cars will break the market. The open market, and particularly that for the basic grade of product, is really much smaller than is usually appreciated, and hence more susceptible to the influences of adverse sales. In such a situation the dumping of even a few cars is multiplied in importance by the fact that they are often offered to a number of prospective buyers and the subsequent use of these offers as a leverage to reduce the general market to a corresponding level."

The remarks of the committee are as relevant today as they were when uttered. Since then, however, one important problem of the open market has been intensified. In my opinion the decreased number of cars that constitute the open market detracts from the profitableness of sales.

In view of the tremendous influence of the open market on the value of all sales, whether made in that market, by contract, or through controlled domestic outlets, the size of this market at once becomes significant and the character of those who trade therein becomes important. Transactions on the open market present, when recorded, an open index to the price at which gasoline may be acquired.

These recorded transactions are not restricted to the sales of companies whose policies of price are based on

the logic of existing conditions but also include the sales of refiners that may by force of circumstances, abandon all thought of manufacturing cost and sell regardless of all considerations beyond their need for immediate cash. It is protection from such sales that makes volume on the open market important and a weighted average price desirable.

A small amount of material sold at a loss should have no great effect on a large volume sold at a fairer price. However, when a range of prices only is considered, the sales of the bankrupt are equally as important as the sales of the finest marketer if the mean between the high and low is accepted as an index of the market price.

Five cars at a certain price are a powerful influence in a market restricted to but a total of ten cars, however these five cars would have but slight effect on a weighted average based on a market of one hundred cars. In this latter case, however, were only the range of prices considered the five cars, if sold at the low of the market, would have equal influence with the 95 if the latter cars were all sold at a higher price. The better class of sellers for their own protection should participate in a market that so vitally affects their profits, and in sufficient volume to make their influence felt.

Another factor that frequently reduces price to an unprofitable level is our sales to brokers. In my opinion it would be far from correct to condemn all sales of this description. Frequently the broker, operating on a reasonable margin and supplying an established market, is an entirely proper, dependable, and useful medium of real assistance to refiners. Just as frequently, however, the broker is but a market speculator, thriving best on wide fluctuations in our prosperity, and dependent on ability to under-price the going market for his sales.

Entirely aside from price that may prevail by reason of the volume of production, brokers sales, inter-plant and inter-group competition, or the restricted volume of spot sales, it seems to me there are many other things we might consider with respect to price and policies of price.

We all know that personal judgment or personal necessity often determines the price at which material sells. There is no downward limit to a market subject to such influence. While competition is a vital factor, as it should be, in our prices, should there not be some discrimination in our interpretation of such a term?

To me it seems entirely wrong that we should be required, or that our policies should allow us to accept the scattered offerings of refiners with the lowest judgment as to value, or the greatest need for sales, as the real competition that limits the value of our product and thus influences, possibly prohibits, the reasonable profit we should enjoy.

Howard Bennette
Managing director of the Western Petroleum Refiners Association

Possibly the problem of price lies in the fact that we have no policy. Certainly this is so if closed transactions are the basic things that make our market. At our mid-year technical and accounting meeting, sponsored by the manufacturing committee, a very interesting paper was presented on refinery cost accounting. Possibly if this were followed up, and the cost of gasoline brought more forcibly and continuously to our attention when making sales, the quality of market prices would be improved. Our marketing committee, also, has presented some valuable suggestions with respect to the level of value of our product that would offer a fair and reasonable division of the spread between retail prices and raw material costs at various times.

Another problem of unprofitable prices may be involved in the distribution of our sales. Possibly too great an effort is expended in obtaining distribution in districts far from the point of manufacture and that this distribution when finally achieved is maintained only at a loss. Many districts, among them Kansas, Louisiana, Arkansas and California, for example, have a scale of refinery prices that recognizes differences in territorial distribution as an element of price. Group 3, with prices of importance to us all, makes no distinction of this character.

We have no means of knowing just what share of shipments moves to various states, nor can we watch the shifting of areas of distribution. At one time the association attempted to gather data of this character and post us in this regard. The effort was abandoned due to the failure of the members to supply their individual records. In 1926 the Government found refineries of the Mid-Continent states shipped the following per cent of total gasoline shipments to points within the Mid-Continent area. Arkansas, 46 per cent; Kansas, 52 per cent; Louisiana, 46 per cent; Oklahoma, 40 per cent; and Texas, 72 per cent. The latter, undoubtedly influenced to a great extent by exports. Since then the distribution has probably altered to some extent.

The point I wish to make, however, is that a large share of the business of all Mid-Continent groups of plants

moves within a limited area, whereas, the Group 3 market applies the same price on what might be termed local sales that it applies on sales to zones of intensive competition with other groups of plants at distant points. I have no recommendation to make in this regard but believe the matter presents a problem. Under no circumstances, however, and regardless of the past example of California, should there be fostered or encouraged surplus that would necessitate the "unloading" or "dumping" of the products of quantity production to the detriment of competing groups of plants.

Price Now Overrules Quality and Quantity in Contracts

For years one of the important problems of the refining industry has been the contract terms under which it disposes of a large volume of its gasoline. Practically every contract of this nature ever written is more advantageous to the purchaser than the seller. It seems unnecessary to state that a contract that is inequitable is wrong in principle. The volume of product ultimately consumed and the terms of contracts are not related. Just so much gasoline will be consumed each year.

At the present time assurance with respect to quality and quantity are minor factors of the contract in comparison with price. In my opinion stabilized margins are essentially correct provided the open market contributes to that stabilization. Probably the only solution to the contract problem rests with the alignment of production and demand and the resultant maintenance of a reasonable refinery price.

I have previously mentioned the increase in demand for high-compression fuels as one of the outstanding developments of the year just past. This question of quality involves many of our problems and probably in a large but unknown degree is responsible for both overproduction and loss of profit.

The types of cars have changed and are still in process of re-alignment, there has been an increased demand for power, for pick-up, and a decided change in demand for anti-knock or other qualities in motor fuels. Unquestionably standard U. S. motor is of far less importance at the present time than in the past.

Changes in the nature of product to meet consumers' needs present nothing new, for refiners have often been called upon to readjust the properties of gasoline. It seems to me, however, that a lack of definite knowledge with respect to quality demand may be responsible in a degree for depression in gasoline values.

We may simultaneously overproduce with respect to a certain grade of product and underproduce with respect to another grade. The net result of these transactions may be overproduction with respect to total volume and that volume may depress the value of all grades of product.

Under a depressed refinery price there is a wide spread between tank-car and tank-wagon prices that frequently allows the jobbing trade to purchase grades of gasoline that are superior from the standpoint of consumers preference and sell this product in competition with an inferior product. This, of course, adds to the volume of overproduction of the inferior grade and tends to further depress the open market price which is so important.

In discussing this with one refiner he explained this situation by saying it was caused primarily by some refiners selling a better than U. S. Motor grade of gasoline through retail outlets at the prevailing U. S. Motor price, that jobbers were obliged to meet this quality competition, and with wide margins were in position to do so.

It seems to me we could profit by better knowledge of the fluctuations in current supply, demand and stocks that made some distinction between grades of product. We have absolutely no information of this character despite the fact that for a long time we have known and frequently mentioned that gasoline is no longer simply gasoline. We have even attempted to coach the consumer in this regard while at the same time we have neglected to reach out for information regarding quality of importance to ourselves. Under present conditions the industry might easily make U. S. Motor a drug on the market and have no knowledge of what was taking place.

Importance of Quality and Specification Stated Back in 1915

Quality is of such importance that one real problem we might examine is the inadequacy of the present specifications. Back in 1915 the Federal Trade Commission stated: "If a law were enacted which would provide that only such petroleum products as contained the desired proportion of sufficiently volatile elements shall be sold in interstate commerce as gasoline, it is believed that it would lead to a desirable measure of classification and uniformity in quality." I quote this simply as an illustration of the long standing knowledge regarding the importance of quality and specification.

It is true we have specifications and that these have been changed from time to time. In my opinion, specifications should be drafted in a manner that makes a quality distinction based on the ability of grades of product to perform certain services in their consumption. We have all encountered, from time to time, surveys that have attempted to determine the reasons that impelled motorists to purchase gasoline at a definite source.

I have yet to note a survey of this character that failed to be impressive with respect to the consumer's high regard for quality, nor one that failed to rank quality of far greater importance than price. We should assist the motorists to weigh the values of quality in comparison with price by specifications and grades of product adequately suited to their needs. This would also enable us to put into our product the qualities that will win for it the permanent loyalty of its consumers.

Suggests Color as Index to Quality of Gasoline

The most highly developed ethics in industry have been attained in merchandising by mail. There it is an integral part of business policy. The refining industry, however, is just now making its first faint efforts to eliminate the old caveat emptor policy in the sale of gasoline. "Let the purchaser beware" has been an antiquated policy in other lines of progressive industry for many years and we might profitably direct our efforts toward that end.

No steps we could take, in my opinion, would be more direct than the establishment of specifications more suited to the motorist's needs than the meager ones in use at present, and the translation of technical descriptions into terms of motor-car performance that would be intelligible to motorists, to the jobbing trade, and to our own employes at the pumps.

One great problem of quality in gasoline lies in the fact that in its natural state the product is ill-adapted to identification. We cannot gauge real differences in value outside the laboratory or by elaborate tests. Some companies have adopted a plan of identification of their product based on artificial color despite the fact that the registration of color as a trademark has been denied. While it may be far-fetched and quite impractical the idea presents itself that color might be used advantageously as an index to grades of product and artificial color made an item of specifications.

I have but briefly sketched a few of the many problems we face today. There are many other matters such as new uses, aviation, advertising, exports, brokers sales, manufacturing ethics, legislation, public relations, taxation, research, products other than gasoline, etc., that involve problems we might profitably discuss. In my opinion, however, our most direct course toward the achievement and maintenance of a reasonable profit in our business involves the quality, quantity, and price of gasoline.

We should bear in mind, however, that competition must be unrestrained, that freedom of individual action must be unimpaired, and that unity of action based on knowledge is the real power behind co-operative effort.

Research Work on New Specifications For Natural Gasoline

By S. S. Smith*

Presented before Western Petroleum Refiners Association, Shreveport, March 10-12

NATURAL gasoline manufacturers are nearing the completion of a research program as a result of which it is hoped to write new specifications for natural gasoline products which will more nearly segregate the several products according to their constituent composition, particularly as to the more volatile ingredients.

They have been working toward the end of stabilizing natural gasoline products against the price of straight refinery products, S. S. Smith, of the natural gasoline department of the Shell Petroleum Corp., told the western refiners at their Shreveport meeting.

He suggested the economic benefits to both the refiner and the natural gasoline manufacturer of providing specifications for the latter's product which will decrease its volatility in times of excess production and will increase its volatility in times of shortage of production.

This would provide refiners with large blending values during times of shortage of production and permit natural gasoline manufacturers highest possible output of their product during such periods.

I HAVE been commissioned by the Natural Gasoline Association to give you, the Western Petroleum Refiners Association, a paper on natural gasoline specificatons. At the time of this assignment, it was expected that the Natural Gasoline Association should have finished their research into new specifications to cover natural gasolines.

This work is not as yet finished, and it therefore devolves upon me to apologize for the incomplete condition of this paper. Some progress has been made, however, and that progress constitutes the substance of this paper.

Gravity Was Only Specification in Early Days of Natural Gasoline

Natural gasoline, as you know, came into existence as an accidental by-product in the production of oil and gas. At that time its only specification was the term casinghead gasoline of some particular gravity.

Its early uses were principally for blending against gravity specifications, although large amounts were used directly as motor fuels in eastern states.

It was inherently a product which could be used as a motor fuel, this being due to the inefficiency of the manufacturing processes which produced it, and the comparatively low volatility of the product produced. Then it was a popular motor fuel, although we did not know what particular characteristics made it successful.

Natural Gasoline Found to Have Anti-knock Easy Starting Qualities

Now we know that its successful use was caused by its high anti-knock quality, its extreme volatility which made for ease of starting and that same volatility which made for flexibility or snap. We know too, that since it was the product of inefficient manufacturing processes, the vapor pressure was low enough to not cause trouble due to gas lock or kindred troubles. This was the more possible because in those days we had no hot-spot manifold and high temperature jacketed carburetors.

Later in the history of the business, when absorption gasoline plants came into being in Oklahoma and the Mid-Continent field, and compression plants had their efficiency improved by somewhat more intelligent design, gravity as a specification became insufficient and there was born at this time a new specification-recovery.

We find, therefore, that in July of 1921, the Association of Natural Gasoline Manufacturers, published nine grades of gasoline designated alphabetically. In these specifications, the important points of consideration were gravity, vapor tension, recovery and initial boiling points.

In December of 1922 the number of grades were reduced to A, B, C, and D. These had recoveries of 90, 85 and 78 with gravities ranging from 72 up to 92.

Improved plant design becoming a more and more important factor we introduced a change in the method of distillation which provided for a 32-36 degree both on the condenser and receiver. This occurred in 1924.

Other specifications remained approximately the same, although the grades were increased to five, A, AA, B, BB, and C. These grades were designed to reflect the difference in gravity and recovery which existed with varying types of plants and in production from fields producing oil of varying gravity.

Again in 1927 we find that the association published five grades which reflected no change over the previous grades of 1924, expect to raise the gravity on grade C to a maximum of 92 baume.

These then, are the specifications which are in force to date. They are as follows: Grade A, 72-79.9 gravity with recovery in excess of 90; Grade AA, 80-87.9 gravity with a recovery of 90; Grade B, 76-83.9 gravity with a recovery of not less than 85; Grade BB, 84-92 gravity with a recovery of not less than 85; Grade C, 80-92 gravity with a recovery of not less than 78.

Reviewing the picture, we find gravity specifications raised in 1924, at about the time stabilization or rectification of natural gasoline became a matter of interest to the industry when the absorption process became current, and thoroughly efficient.

The subsequent change in 1927 was to permit the inculsion of slightly higher gravity products in grade C, further reflection of increased efficiency of plant extraction from field gases.

This picture exists today. We have five grades, two of which are especially designed to take care of high gravity, high recovery products produced by proper rectification of natural gasoline in the field.

Since the time of the last change of specification, there have come various changes in the industry which are disquieting to manufacturers of natural gasoline and to refiners.

New Research on Specifications Started in Increase Consumption

It has been necessary to revise our ideas as to what constitutes profitable operation. It has been necessary for us to learn to better economize in operation and manufacture. It has become necessary for you to derive more gallons of gasoline per barrel of oil, produced and delivered at your refinery gate.

We now find ourselves manufacturing a product meriting consumption but we find consumption falling far short of production. We have come to assume therefore, that existing specifications do not encourage fullest use of our product. And with this thought in mind our association has

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embarked on new research into specifications which may encourage such use.

While you know, perhaps better than I, the individual constituents which make up natural gasoline, let us review them and get clearly in mind the merits of each constituent and the part it plays in the finished natural gasoline as you receive it.

The range of products included in natural gasoline are the hydrocarbons, propane to octane, the chemical series C^3H^8 to C^8H^{18}, and in the Mid-continent at least, all of the normal saturated compounds and their isomers, together with some of the cyclic compounds in the series.

Volatility Is Represented in Pentane, Butane and Propane

Of the series we can dismiss from consideration here, the three octane, heptane and hexane as being of value primarily as solvants or retaining agents for pentane, butane and propane. The three products, octane, heptane and hexane you already have in refinery stock in large quantity. Our sale of such products to you is incidental to the sale of volatility represented by pentane, butane and propane.

Pentane has a boiling point of 97°F. and a vapor pressure at 100° of approximately 1 lb.; butane has a boiling point of 32°F. and a vapor pressure of approximately 37 lb; propane, the lightest in the series, has a boiling point of —44° F. and a vapor pressure of approximately 180 lb.

Considered singly and separately, propane is a product which can be retained in high pressure cylinders at normal atmospheric pressure; butane can be retained in rather low pressure cylinders but requires pressure vessels; pentane can be carried around in a bucket like water, Hexane, heptane and octane must be vigorously heated to boil, and are entirely stable at normal temperature and pressure.

As you know, these six products are extracted from natural gas by absorption or compression methods, which remove all of the octane, heptane and hexane, most of the pentane, part of the butane and a small amount of the propane, and the measure of percentage of the recovered products, pentane, butane and propane, is a measure of the efficiency of plant extraction.

Market Cannot Absorb all Volatility That Can Be Put Into Product

If we could conceive that the market would absorb all of the volatility which the natural gasoline manufacturer could build into his product, then the normal procedure would be to run the plant extraction efficiency as high as possible, store the product derived from such extraction in high pressure tankage, ship in high pressure tank cars and let the refiner blend under pressure. This would enable the refiner to make the maximum gallonage of finished motor fuel from a minimum amount of crude oil.

Since the market picture is different, it behooves us, to look at the picture judiciously and decide that which is economic and to the best advantage of both refiner and manufacturer.

In the preceding outline of characteristics of individual constituents, it would appear on casual inspection, that any refiner would desire a butane-free natural gasoline. That might perhaps be true, if the specifications of individual products as given were the sole and only specifications and qualities which these products possess. However, they have certain other and useful characteristics.

Heptane, as you know, is used as a base standard for anti-knock specifications, it having the lowest benzol equivalent of any of the normal volatile hydrocarbons.

All Series, Except Heptane, Well Above 50 Per Cent Benzol

Speaking in terms of compression ratios, at which it can be operated without knocking, we find heptane will stand 3.75 compression ratio. Hexane, the next in series, will stand 5.2 compression ratio; pentane, 5.85 compression ratio; butane, 7 compression ratios and propane 7.5 compression ratios.

Speaking in terms of benzol equivalent, all of these except heptane are well above 50 percent benzol. Since most motor fuels on the market have benzol equivalent not much in excess of 35 percent, it can easily be seen that the blending value of natural gasoline against the detonant qualities of normal gasoline, is excellent.

Its chief value, however, rests in its volatility. On this score, propane, butane and pentane, all having volatilities of 100 per cent at 100°, are excellent for the purpose of increasing startability, acceleration, etc. of your finished motor fuels.

If we consider the blending value of each individual constituent in natural gasoline, and endeavor to work with these values, the blending operation becomes a complex one. Fortunately, it is not nearly so difficult.

The prospect of analytical specifications for natural gasoline worried all manufacturers for some time. It is my understanding that there were even some contracts closed on the basis of analytical specifications, that is, that natural gasolines were to have certain percentages of pentane, butane or propane. This burgbear no longer exists. Intelligent natural gasoline manufacturers and refiners generally now concede that there is no necessity for individual component specifications, but that the measure of usefulness of natural gasoline as finished blending stock, rests in some effective and proper measure on its volatility.

The work which the association has done during the last six months on this subject, points very strongly to the adoption of some such specification. Most of you will recall that Oberfell and Alden of the Phillips Petroleum Co. last year published an article covering the analysis of natural gasoline by A.S.T.M. distillation methods, and those of you who recall this work will undoubtedly agree that if you check this method against actual analyses, it is accurate within rather close limits.

A year's use of the method among natural gasoline manufacturers has only necessitated correction of the curve at extremities, that is at the low and high percentage butane and pentane points.

Can Evaluate Gasoline on Composition by A. S. T. M. Distillation

This indicates that it is easily possible to evaluate gasoline on its composition by names of A.S.T.M. distillation. Since this fits into Dr. Bridgeman's, Dr. Brown's and the association's work, such a valuation must be sound in principle and practice.

The old grades of gasoline, A, AA, B, BB, and C. indicate practically nothing of composition and little of the blending value of such products. It is possible for instance, under AA specification to sell products having a range of butane content from 15 to 35 per cent and pentane content from perhaps 15 to at least 50 per cent.

Since most of the gasoline made and sold is AA specification it can easily be seen that the buyer of AA grade gasoline, on open spot market, is likely to get almost any kind of product.

If we concede that all manufacturers will crowd the top limit of specifications then the chances are that when the refiner buys AA gasoline, he will receive a product having little over 90 recovery and close to 87.9 gravity. Still when he receives such specification, there is possible a wide range of composition.

Recovery is principally a function of vapor pressure, although vapor pressure does not necessarily define the composition. This statement means of course that composition of gasolines having the same vapor pressure may vary widely. It also follows that vapor pressure is not necessarily indicative of blending value, although in an efficiently operated plant with proper rectification, vapor pressure is closely analogous to utility of product.

Natural Gasoline Useful in Effecting 10 Per Cent and 122° F. Point

We may express it this way, that vapor pressure is a useful negative specification, although not necessarily a useful positive specification. We have said before that volatility of natural gasoline is its chief asset.

If we concede that vapor pressure is not necessarily a measure of volatility.

then some other measure becomes necessary. Recent government specifications covering finished motor fuels, both for aviation and motor use, stress the importance of the 10 per cent or the 122° F. point. Natural gasoline is chiefly useful as effecting these points. Vapor pressure and anti-knock quality of the finished motor fuel can be calculated in advance of blending. As far as I know, no one yet has laid down effective rules for tying into the finished motor fuel specifications, the boiling points of natural gasoline. Experiments which the association is now carrying on, however, indicate that it will be possible to blend to a fixed or predetermined 122° point, or to a fixed or predetermined 10 per cent distillation temperature, and prophesy with extreme accuracy the finished result. When this work is completed and released, we will have placed in the hands of all refineries, information which will enable them to use, with least possible effort, the largest amount of natural gasoline economically possible.

It is a point for discussion of course, but after experimentally using a number of different fuels this winter in an automobile of standard make, which has no unusual characteristics of its own, I am thoroughly convinced that few refiners are yet using enough natural gasoline.

Writer's Experience Shows "Natural" Would Improve Motor Fuel

By this I mean that most gasolines are not sufficiently volatile to give good motor performance in cold weather. I mean also, that they are not sufficiently volatile to start on cold mornings. I mean also that they are loggy because they do not have sufficient volatility to give quick acceleration. I mean also that their anti-knock qualities can be improved by the use of more natural gasoline.

I was told just before leaving Tulsa for Shreveport, by one prominent Mid-Continent refinery chemist, that I was mistaken in this point of view, and that most refineries knew more about the use of natural gasoline than I had ever dreamed, and used it in far larger percentage than I suspected.

I do not advocate excessive use of natural. I do advocate, however, that you use quantities of natural which will permit you to build into your gasoline vapor pressures as high as 8-10 Reid. I would place as a possible limit on the use of natural gasoline, butane composition of 6-8 per cent in finished product. I would advocate always for motor performance that natural be used up to any point which will not give trouble due to vapor lock.

While this may already be done by refiners, I am firmly convinced that if so, some of you are not blending natural in such form that desired qualities can remain in the product. In other words, you are blending to vapor pressure rather than to volatility. I know that a great many motor fuels which I have used this last winter have certainly not had sufficient volatility to make decent performance, and that this condition can easily and cheaply be remedied by the use of natural.

It is our opinion in the Natural Gasoline Association, that if we can provide specifications which will decrease the volatility of natural gasoline during times of excess production, and will increase the volatility of natural gasoline during times of shortage of production, which although remote are possible, then the economic benefit to you in the refinery and us in the natural gasoline business, will be two-fold.

It will first provide you at low cost, large blending values during times of shortage of production, while permitting us the highest possible production during such time. It will also permit during times of excess production, the manufacture of lower volatile natural gasoline which can be used in larger quantities to achieve the same results, while permitting us to lower our output during such times of excess production.

Specifications which would permit such reduction by volatility grades would perhaps tend to stabilize our industry while benefitting you in permitting higher gallonage use during low priced natural market. Such specifications, too, fit into our proper definition of volatility so that such volatility definition can be intelligently used in advance of blending.

Natural Gasoline Division Must Produce Regardless of Market

In our specification committee work, consideration has been given to the 100°F. point, the 122°F or 50° centigrade point and the 140°F. point. Difference in composition of additive percentage of butane and pentane is best reflected by the 122°F point. Difference in pentane composition is best reflected by the 140° point. Difference in butane composition is best reflected by the 100° point. Difference in propane composition is best reflected by the vapor pressure. Our work does not yet indicate with certainty the point which best reflects the actual blending utility of the gasoline.

The natural gasoline industry is in the peculiar position of being the sole part of the oil industry which must continue to operate regardless of the market.

The production from oil wells can be discontinued when they become unprofitable, or such production can be stored during times of unprofitable operation. Refineries can in times of duress, cease to manufacture any product, or they can curtail thruput while storing crude, or by not buying crude. The natural gasoline industry, in contrast to the oil producing and refining industry, is compelled to process its raw material when produced, and the production of such raw material is in the control of oil operators, not the natural gasoline manufacturers, therefore, we must continue to manufacture products or give up investment in plants.

The only means we have of curtailing production, then, is not by limiting purchase of gas and plant thruput, but by means of rectification, reduction of volatility, vapor pressure and gallonage by wasting the more volatile components of our natural gasoline.

Our industry is built on the salvage of an otherwise economic waste. The raw material which we buy must be purchased on open contracts which compel us to take or pay for raw material whether we make a profit or not.

Our product is sufficiently volatile to require expensive, high pressure storage, therefore it is almost incumbent on us to sell it when manufactured. Our industry therefore finds itself in a most vulnerable position at the hands of economic law.

A few cars of distress natural gasoline can force the market below possibility of profitable operation. On the other hand, a slight shortage of natural gasoline can bring the market above that of refinery products.

We in the natural gasoline industry, would much prefer prices related to refinery prices. We have no desire to force refiners to pay prices for our product which entail loss on his part, and we are not foolish enough to expect such price structure.

Believes It Economical to Stabilize Price With Refined Product Market

We should like, however, and believe that it is economically proper and possible, to stabilize the price of natural against the price of refinery products, so that we can compute in advance with some measure of accuracy, market possibilities, and therefore can judge with some measure of success, the economic prospects of possible plants.

If it is possible for us to so design our specifications that we can have the hearty support and cooperation of refineries in achieving such an end, then the association is repaid for its research.

We desire your advice as to what line to pursue. We recently sent out a questionnaire to some 56 refiners, covering their desires in the use of natural gasoline. The response to this questionnaire has been very gratifying, and of immense value to us in the specification committee's work. I will very much appreciate personally, any further suggestions you may offer, toward improving either the quality of our products, or the specifications under which said products are sold, and it is for such purpose that the association has requested me to deliver this paper.

Depreciation of Refinery Equipment

By H. W. Camp* and L. D. Mann*

Presented before Western Petroleum Refiners Association, Shreveport, La., March 10-12

THIS subject is very likely a relatively new one for most refinery operators, however, it is one that is brought forcibly to our attention by narrowing margins of profit and the radical changes in refinery equipment during the past 10 years.

Formerly, it was the policy to establish prices that met market conditions but now it is the manufacturing department that must furnish accurate cost prices if proper earnings are to be maintained on our investments.

Most of you can readily recall operating conditions in the period between 1915 and 1920 when gasoline prices were in the neighborhood of 20 cents per gallon f.o.b. refinery, and fuel oil prices of the winter of 1919-1920 when we sold every available barrel for $2.50 to $3.50.

Even though the crude cost was relatively high, these prices permitted high margins of profit and the operator did not think much of manufacturing costs.

"Good old days" Gone; Cost System Necessary for Refinery

But the "good old days" to use refinery parlance, are gone forever and we have all gone through a period of close shaving; cutting corners and reducing expenses, all in an effort to stay in the business and keep our margins "black." Even with the closest economies we are sometimes in the "red" and have a long hard fight to keep operating. Keener competition, the much discussed over-production and the pressure still have all helped to bring about this change.

Now, every refinery has a very complicated cost system; we know where every lost barrel goes; to evaporation, to treating or filtering. We know what treating costs are to a tenth of a cent per barrel; we pack our pumps every time a small leak occurs, special men are assigned to keeping steam leaks to a minimum and the fuel expense is scrutinized to obtain the benefit of the lost B.t.u.

What is the purpose of all these figures? What good do they accomplish? Only one thing—they tell us what every individual gallon of refined oil costs, whether it be gasoline, some special naphtha or lubricating oil, and we can go to our sales managers and point out forcibly such items as selling naphtha for an eighth of a cent below cost or go to the purchasing agent and inform him that caustic soda or litharge costs are too high.

But cost figures are not sufficient. Conditions have grown still worse for the refiner and any operator who uses only his manufacturing expense as a basis of costs has already found, or will soon find, he has an obsolete or worn out plant with no reserve built up for replacements or additions.

Some of you are familiar with old plants which have operated 20 to 30 years, they still have the old familiar receiving house, or the same loading rack or even the same old batch stills hooked up as a continuous battery with some new fractionating columns and maybe a new bottom on two of the stills.

Pressure Stills Bring New Problems In Plant Depreciation

But what about the pressure stills that were built five years ago; all new chambers were installed recently or the condenser coils had to be renewed, or the piping replaced and perhaps 30 or 40 new tubes installed in the pipe still.

What is the difference between those old times and present times? The real old plants were operating on sweet crudes such as Pennsylvania, they were built small and ran a certain amount of crude; the batch operation limited them. Now the same number of stills have been hooked up to run continuously and handle twice as much oil and they do it more efficiently.

Who does not remember his own plant running a thousand, two thousand, or three thousand barrels daily, and now you handle twice that much. You added a couple of towers and a heat exchanger and your plant capacity doubled miraculously, and your maintenance doubled too. You had more still bottoms to replace, more vapor lines and condensers to renew but you had to keep going and the only way to fight lower margins and supply increased consumption was to run more crude and try to keep earnings up in that manner.

The successful operation of any refinery seems to depend on the ability to crowd every possible barrel through the facilities that are making money.

These new factors of expense must be overcome and provided for in some manner and it seems that the most satisfactory method is to set up some depreciation and obsolescence rates that are adequate to cover the individual needs of every type of refinery equipment.

Such rates would naturally depend on management policy regarding maintenance expense and also on the type of construction and kind of crude run; however, they should be sufficiently high to cover replacements but not high enough to permit accruals to exceed replacement demands.

Good depreciation rates also can be used to advantage in calculating federal taxes and should by all means be used for this purpose.

The establishment of a policy covering maintenance is essential to proper consideration of depreciation. Most refiners have set up a system in which all minor repair work is charged to normal maintenance and in this way they expect to keep their plants in first class condition. Of course, large items and obsolescence would not be considered and, therefore, such practice is not satisfactory if a true condition is desired.

It is only by the utilization of a conservation of proper manufacturing expenses and depreciation rates that the refinery operator can satisfactorily calculate actual costs and if he wants to be fair with himself and the executives of his company it is imperative to use both intelligently along with the obsolescence factor.

Depreciation is Separate and Distinct Problem for Each Plant

Many plants are operating on sweet crudes, and in some cases the source of supply is definitely established; such plants are fortunate enough to enjoy relatively low depreciation rates. Others depend on large gathering systems for their crude supply and naturally the depreciation rates should be higher because of different crudes handled and the possibility of handling very corrosive oil from time to time.

Each plant probably presents a separate and distinct problem and they should be considered as such. Many plants have special problems. I recall one plant where it was practically impossible to keep rundown lines from condensers to the rundown tanks in repair. Other plants find

*Empire Oil & Refining Co.

that condensers are a source of great trouble, or roof corrosion may be a serious difficulty. Everyone apparently has all the usual trials and tribulations of refining petroleum with a few special ones thrown in, which means that each operator must necessarily establish his own depreciation rates.

To provoke discussion, I have listed a few comments on the principal items of refinery equipment. Several refiners have contributed depreciation rates and the following remarks are based on either their rates or their own comments on such rates.

It is realized that depreciation can start an argument among refinery men that would be only excelled by the cracking patent situation; however, the following figures are presented for your consideration.

Beginning with automobiles and trucks, we find that most refiners generally agree that a high rate is necessary, several use 25 per cent while the majority use 33 1/3 per cent. For the benefit of the managers present, it might be mentioned that depreciation rates could be materially reduced on this type of equipment by furnishing Packards or Pierce Arrows to all refinery superintendents.

Buildings reveal some variation. Brick, reinforced concrete, transite and steel or galvanized iron would probably all take slightly different rates. The average used seems to be 5 per cent while some are as low as 3 per cent and others as high as 7.5 per cent.

Condenser boxes seem to be fixed about 5 per cent—one refiner using 10 per cent, perhaps due to bad water conditions. Condensing equipment and cooling coils raise some very marked differences, depending on whether used on crude or cracking stills.

One refiner reports 33 1/3 per cent on pressure still condensers while the crude still variety are quoted at 6¼ to 25 per cent. Naturally, this item is a particular thorn to some plants and corrosion conditions would vary the depreciation rates.

Agitators, boilers and loading racks are listed at 6¼ to 10 per cent and unless conditions are very bad this seems sufficient. Pumps and compressors take a somewhat higher rate, one refinery being as low as 6¼ per cent while a majority use 15 per cent. Water pump stations average 7½ to 10 per cent while laboratory equipment appears to be 25 per cent due to the fragile and delicate apparatus used.

Furniture and fixtures is listed at about 10 per cent, one refiner being as low as 7.5 per cent.

Tools take a considerably higher rate; one plant reporting 50 per cent while others use 33 per cent and 15 per cent. Possibly the refiner using 50 per cent has established a "disappearance rate" instead of a depreciation rate and I would suggest that he move the machine shop further away from the fence.

Storage tanks are established at approximately 5 per cent while small tanks are listed at 10 per cent. This may be too low, especially at plants where serious corrosion is encountered on run down tank roofs.

Oil pipe lines represent a large portion of refinery investment and most refiners use 5 per cent for a depreciation rate. Unless soil conditions are unusually bad this should be adequate.

Crude Stills, Fractionating Towers Use 15 to 6¼ Per Cent Rate

Tank cars are quoted at 4 to 5 per cent and with proper repairing facilities this seems sufficient, while tank car repair shop and equipment is somewhat higher, being 10 per cent.

Crude stills and fractionating towers show some startling variations which probably reflect the different conditions under which each refinery operates. One reports 15 per cent while the majority use 10 per cent. One refiner is as low as 6¼ per cent, another uses 7 per cent.

It is likely that the plants using a high depreciation rate for this type of equipment are trying to include an obsolescence factor as no facility becomes obsolete any faster than distilling equipment, whether it be operated at atmospheric or high pressures. The kind of crude run would affect the rate more on this type of equipment than any other except pressure stills and probably each rate can be justified at each particular plant.

Pressure stills really have caused most refiners to be concerned about depreciation and it is significant that all the men solicited for information gave very explicit explanations on this item of refinery equipment.

Some favor an over-all rate on all cracking equipment while others manifest a desire to have distinct rates on chambers, piping, condensing coils, furnaces and the other items that make up a complete pressure still. On pressure piping alone, one plant uses 25 per cent while another favors 33 1/3 per cent and still another requires 50 per cent.

While the usefulness of cracking equipment is relatively short-lived, there is always the possibility of some salvage value; however, the obsolescence factor again enters and it appears more desirable to have the rate slightly high rather than too low. This is especially true as these stills present more of an operating hazard and are subject to unusually hard service. The plants combining all pressure still equipment in one group use anywhere from 10 to 25 per cent as a depreciation rate. The type of still and quality of charging stock being the determining factor.

The only other item to be discussed is sewers and traps which show very remarkable variations. Two plants use 7 per cent while several others use 10 per cent and one requires 33 per cent, which I believe was an agitator sewer. It would seem, offhand, that too much acid was used in the sewer and not enough in the agitators.

Depreciation Rates on Refinery Equipment

Agitators	6¼–10%
Automobiles	25–33⅓%
Boilers	6¼–10%
Buildings and structures	3–5–7½%
Condenser boxes	5–10%
Condensing equipment and cooling coils	6¼–15–25%
Crude stills and towers	6¼–7–10–15%
Cracking stills (overall)	10–12½–20–25%
Cracking still piping	25–33⅓–50%
Cracking still chambers	12½–20–25–33⅓%
Cracking still condenser coils	12½–20–25–33⅓%
Furniture and fixtures	7½–10%
Loading racks	6¼–10%
Laboratory equipment	25%
Pumps and compressors	6¼–15%
Storage tanks	3–5%
Small tanks	5–10%
Tank cars	4–5%
Tank car repair shop and equipment	10%
Tools	15–33⅓–50%
Oil lines	5–6¼%
Sewers and traps	7–10–33⅓%
Water pump stations	7½–10%

The above rates have been collected from many Mid-Continent refiners by the authors of the accompanying article, and both small and large plants are included so that some very fair average conditions should be reflected by this information.

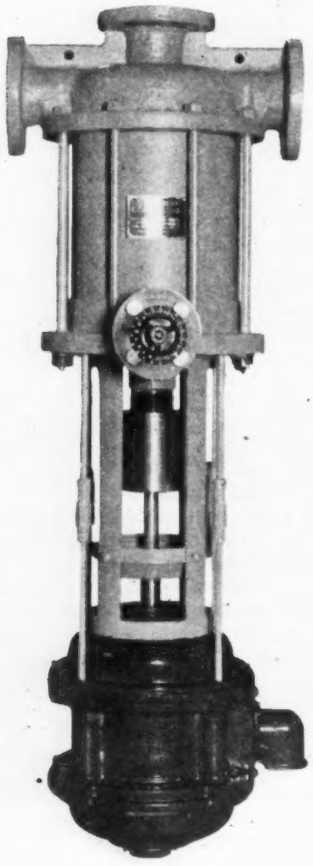
Continuous Treating and Dispersion Contactors in Modern Refining

By C. W. Stratford*

Written Exclusively for NATIONAL PETROLEUM NEWS

WHILE developments in distilling and fractionating methods and equipment have progressed rapidly over the past few years and have been generally adopted by petroleum refiners, it appears that the development of treating methods and treating equipment has lagged entirely too far behind the advancement made in distillation.

The economic gains that can be won in this direction, by the betterment of treating methods and equipment, are so great as to merit careful consideration and formulation of more rational treating programs.



8-inch "Stratco" dispersion contactor

The major problem in treating is that of removing undesirable components from the distillates in order to convert them into stable, marketable products. Obviously, when treating methods are unsuitable to produce stable colors and other desirable physical and chemical properties, the distillates must be treated again, or redistilled at considerable expense.

The cracking of heavy oils into large quantities of cracked, volatile distillates has greatly accentuated the need for the development of more adequate means of economically treating pressure-distillate or cracked, fractionated, end point gasolines.

In addition, the production of large quantities of sour crude oil, of high sulphur content, requires specialized treating methods for the removal of undesirable components, and especially for the reduction of sulphur in the gasolines produced from these crudes.

A brief review of prior art is usually interesting and instructive.

The most ancient method of dumping distillate and treating agent into a cone bottomed agitator and blowing with air has been discarded, principally because of insufficient mixing effect, long treating time and loss of oil.

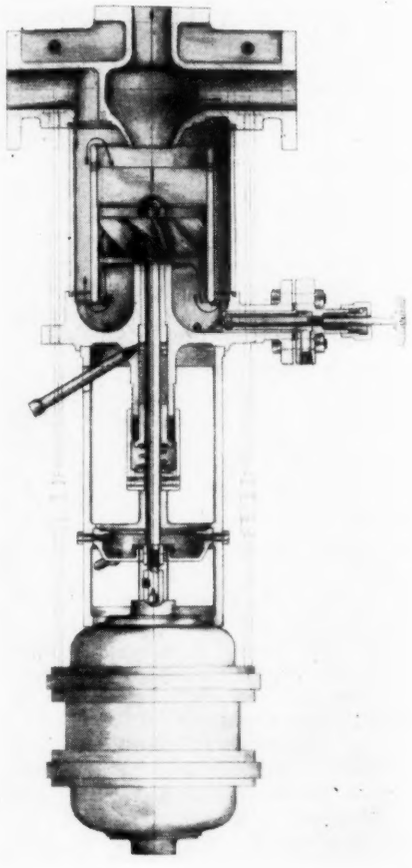
The next type of treater consisted of a charging pump, closed coils connected by return bends, finally discharging into a cone bottomed agitator. The treating agent was injected into the charging stream of distillate and was forced through the hair pin coils under high pressure and velocity. This method was more satisfactory in contacting the treating agent with distillate than was air agitation. In the agitator, the distillate and treating agent were allowed to separate and the sludge was withdrawn from the bottom of the agitator.

A modification of the hair pin coil treater was a large tube treater, in which were arranged multiple orifice plates for impressing velocity and turbulence on the liquids flowing through them. Similar treaters consisted of vertical shells, equipped with plain or perforated baffle plates, and in some instances bubble caps were applied for dispersion and mixing effect between the distillates and the treating agents. The hair pin coil and the large tube, multiple orifice plate, treaters require excessive power and give poor mixing effects.

Another type of treater consists of a horizontal cylinder in which a shaft equipped with paddles, is rotated. The distillate and treating agent are pumped through this tank for mixing.

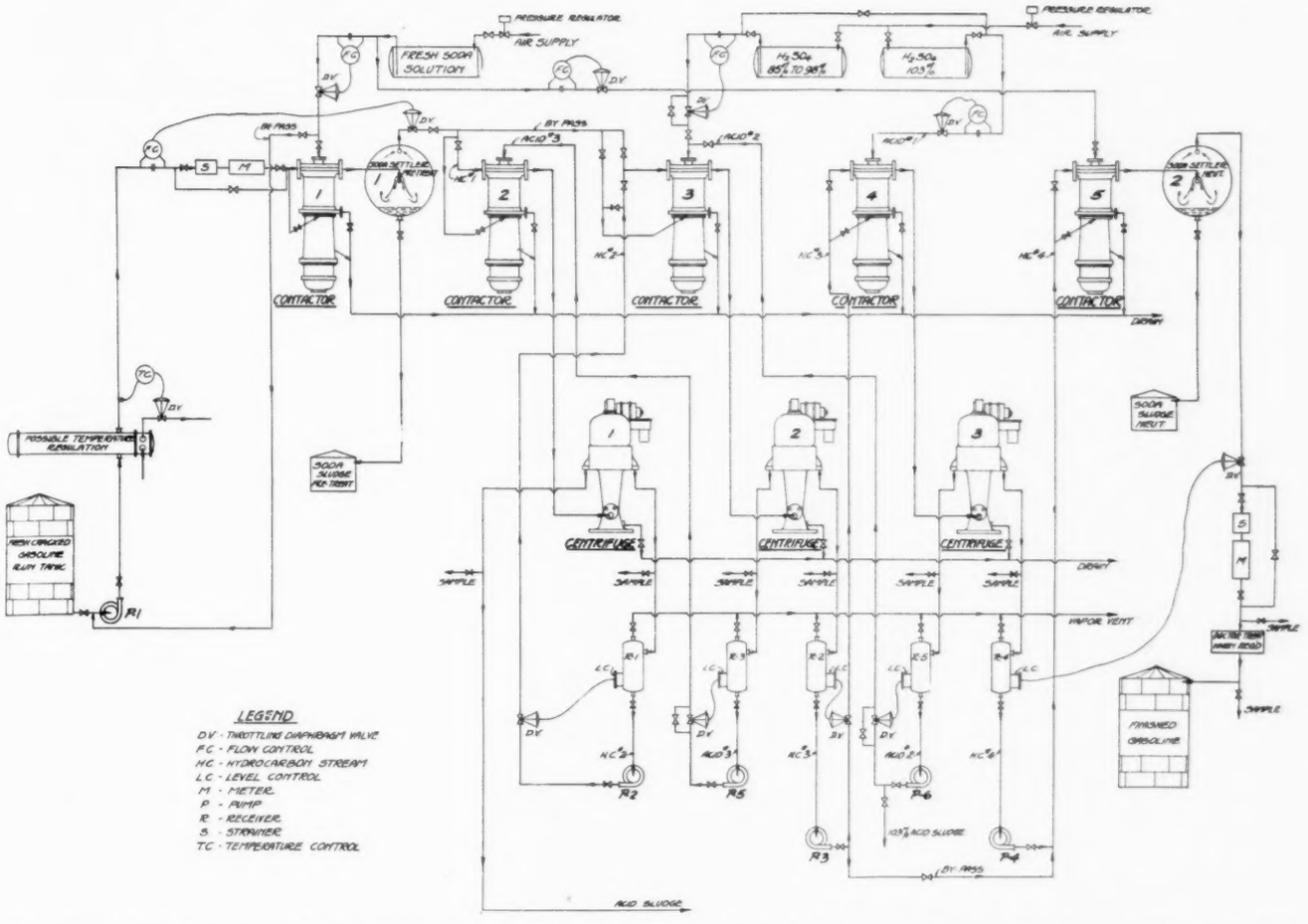
A jet and plate treater has been used, in which a jet of distillate and treating agent is discharged, at high velocity, through the orifices and directed to impinge against a flat plate for turbulence and mixing effect.

Centrifugal pumps are used for mixing, in which case the distillates and



Cross section of "Stratco" dispersion contactor. Note propeller for imparting velocity, and means for frequent changes in velocity and direction of flow

*Stratford Engineering Co., Kansas City.



Treating plant for cracked gasoline employing dispersion contactors and inter-stage centrifugal separation, in which the flow of the treating agents and distillates is counter current

treating agent are charged to the pump and are circulated through a by-pass and finally discharged into an agitator or settler.

Another type of mixer used consists of one or more centrifugal pump rotors, suspended on a rotor shaft in a tank. The liquid enters these rotors at the axis and is discharged by centrifugal force to the walls of the tank through some form of diffuser to prevent rotation of the body of the liquid. This type of mixing effect is taken from the chemical industry where it is often used in nitriding equipment. The discharge from these rotors agitates the entire contents of the tank. This type of mixer consumes much power.

One of the most interesting machines used for mixing distillates with treating agents is the colloid mill or homogenizer. Although the power consumption of this type of machine is very high, the mixing effect is good. One serious difficulty usually experienced with the homogenizer is that of maintaining a properly proportioned mixture of distillate and treating agent passing to the homogenizing surfaces. Mixtures produced by homogenizers are practically impossible to separate except by the use of centrifuges.

All of the above mixing devices are subject to improvement. High velocity mixers and impingement mixers consume much power and dissipate the energy consumed in zones of localized, destructive turbulence without accomplishing desirable dispersion. Part of such mixtures are over mixed and, therefore, difficult of clean separation, while the greater portion is insufficiently dispersed and contacted. Centrifugal pumps, especially those by-passed, and similar devices depending on centrifugal force for the circulation of fluids, defeat the purpose, in part, of the major requirement of dispersion because of undesirable separation resulting from the application of centrifugal force.

Batch agitators, open or closed, and settling tanks, containing quiescent liquids are good separating devices but they have several disadvantages, such as the difficulty of making a clean separation between sludge and oil, and they give no control over the frequently important factor of settling time. In proportioning vertical settlers employed in continuous systems, designers often overlook the essential fact that separation by gravity is chiefly determined by the area of the liquids exposed to the force of gravity.

Many settling tanks give poor results for the reason that the in-feed liquid is discharged directly into the settler at relatively high velocity, without provision for the decrease of this in-flow velocity. Even a low rate of in-feed liquid entering a large tank carries sufficient energy to seriously disturb the entire contents, to the extent of preventing desirable settling and coalescence of the fine particles in suspension, and their subsequent rapid separation by gravity.

A more detailed review of the prior art in this refinery operation will clearly show a marked tendency toward the use of mechanical energy for accomplishing more satisfactory dispersion and contacting, and the recognition of the need of more efficient separating means.

A definition of the principal objectives to be attained in treating and a simple analysis of the problems involved are helpful in bringing out the need and advantages of employing continuous, closed treating systems and necessary accessory equipment.

The chemicals to be used, both as to character and concentration, should be appropriate for the desired chemical reactions with the distillates being treated, and suitable for the removal of undesirable components.

In determining the number of chemical reacting stages to be incorporated in a satisfactory treating plant, the important item of solution equilibria should be constantly borne in

mind. Physical chemistry is a subject which throws much light on this important phase of treating.

The speed of chemical reactions and the limit to which such chemical reactions may proceed are mostly defined by the temperatures at which the reaction occurs, to the degree of dispersion and intimate contacting of the chemical components involved in the reaction and to the period of time during which the chemical reaction is allowed to proceed before complete separation is made of treating agents from distillates.

Polymerization should be prevented as far as possible. This is especially true in the case of cracked gasolines, frationated to end point before treating in order to avoid a sensible increase in end point, and also to prevent the removal of valuable unsaturated hydrocarbons which have high anti-knock fuel properties. Naturally, heavy polymerization results in increased loss otherwise salable distillate, in the sludges, and usually requires costly rerunning of the treated distillate to again bring it within the necessary boiling range.

Maximum economy in chemical treating can best be obtained by the reduction of the amount of chemical re-agents required for treating distillates to desirable properties. This may be accomplished by maximum dispersion and intimate contacting, and by employing a counter-flow, multi-stage continuous treating system equipped with means for intermediate separation of distillates from treating agents.

In this system the separated acid and distillate flow in opposite directions. As the available acidity in the treating agent decreases it is contacted with more highly reactive raw distillate. The fresh acid entering this counter-flow system is contacted with distillate as it approaches the finishing stage.

Undesirable polymerization can be controlled, either by carrying on the treating operation, in the acid stage or stages, at greatly reduced temperatures, or by limiting the total contacting and separating time within the acid stages. In the latter case the total volumetric capacity of the treating system must be restricted to a minimum, that is the system comprising the dispersing and contacting stages added to the centrifugal separating stages and all inter-connecting lines through which the distillate passes while in an acid condition should have a minimum volume.

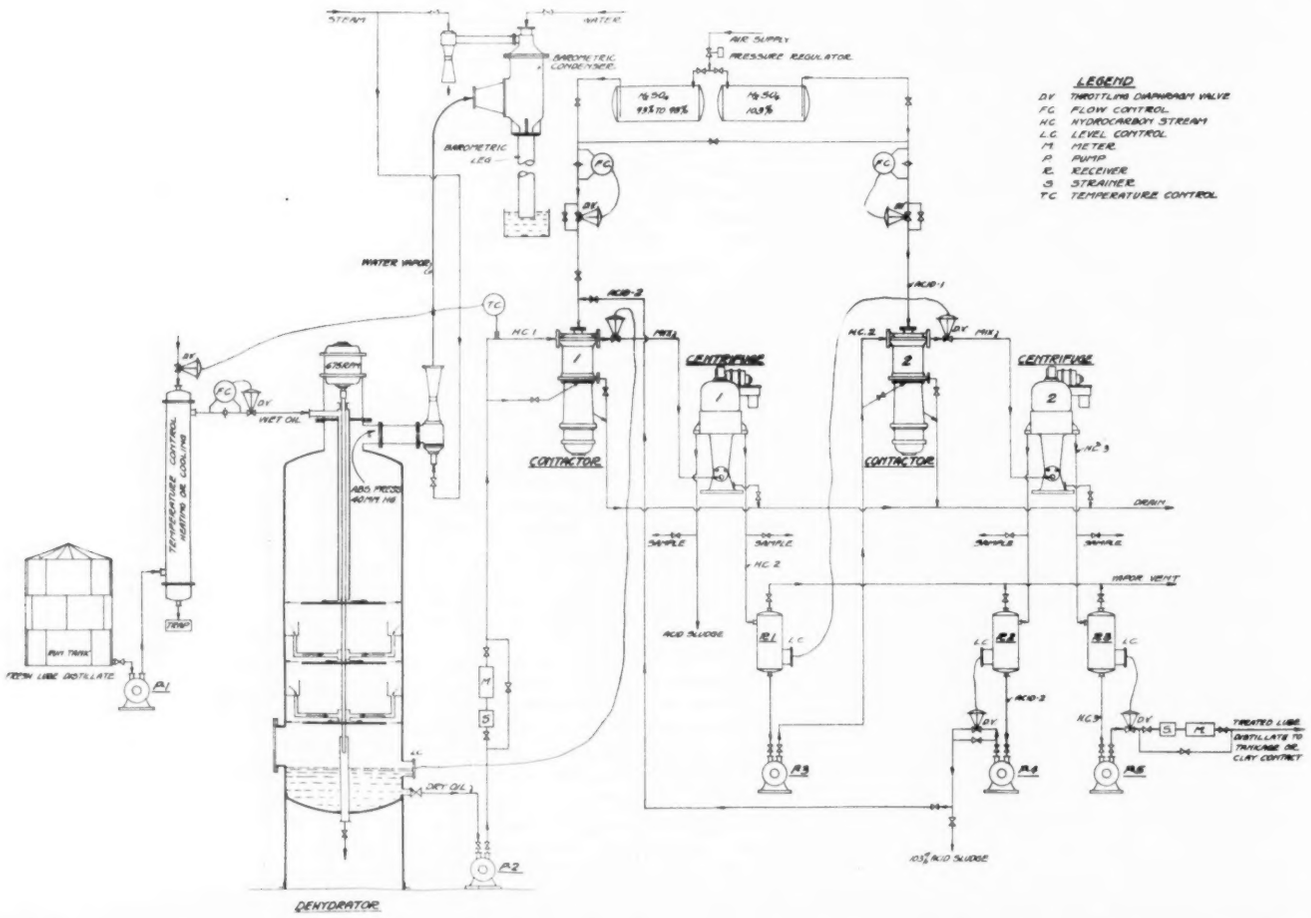
The hydrogen sulphide, organic acid bodies and nitrogen compounds can be removed from the distillate by a pre-soda treat. When complete separation is made following this pre-soda treat, no water wash is required before the first stage contact with acid.

The mercaptans can be removed by the use of one or more counter-flow stages in which weak acid is used.

The sulphur content of some distillates can be brought within the limit of specifications by the use of a relatively small quantity of strong acid and that of others by the use of an excess quantity of strong acid. In the latter instance, the solvent properties of strong suphuric acid on organic sulphur compounds is correspondingly increased.

For the regulation of treating temperatures, heating or cooling means may be applied to the distillate stream charged to the system and it may also be applied to the individual contacting stages.

In the stages where the distillate is in an alkaline condition, rapid separation by use of centrifuges is ordinarily unnecessary. Such separation can be made by the use of horizontal settling tanks equipped with means for distributing the mixed liquids over the entire length of the tank. The rate of flow can be reduced by passing the distributed mixture down through an elongated hydraulic



Two-stage continuous treating plant equipped with disc vacuum dehydrator and dispersion contactors. The treating agents may be charged to the contactors with or without counter current flow. Complete separation is made by use of centrifuges

diffuser and the distillate thence upward to the distillate outlet at the top. The separated heavy liquid is removed from the bottom of the tank.

In all treating systems, means should be applied for accurately regulating the rate of flow of distillate and the rate of flow of treating agents to the system. A good method of doing this is by the use of flow controllers and appropriate, throttling diaphragm valves.

It is usually of great advantage to charge distillate to the treating system in a fresh condition as soon as possible after it comes from the condensers of the distilling system, before undesirable chemical reactions have had time to occur in the distillate and without exposure to air.

The above is a brief resume of some of the principal items connected with treating.

The subject of appropriate mechanical equipment for modern treating plants is one of great importance.

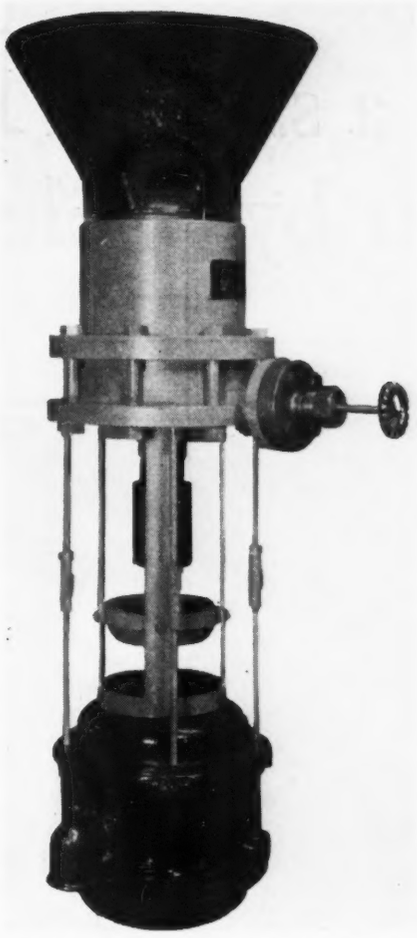
The centrifuge is unquestionably the most efficient device available for rapid, continuous and complete separation of distillates from treating agents. There are several centrifuges available which are highly developed for other separating uses. However, the design of centrifuges must be somewhat modified so as to more fully meet the requirements of continuous treating.

In the design of all mechanical mixers, the problem of satisfactorily mixing liquids or finely divided solids in liquids is clearly one of hydraulics and all elements of the machine must therefore be considered from a hydraulic viewpoint. The desirable objectives of infinite dispersion and intimate contacting are specified by the requirements of modern continuous treating systems.

The use of very small percentages of treating agents increases the difficulty of dispersion. In attaining dispersion and intimate contacting, the liquids must be circulated, at high velocity, avoiding, at the same time, as far as possible, the exposure of liquids being mixed to the action of centrifugal force. In order to accomplish thorough mixing within the necessary, short time, the volumetric capacity of the mixer must be small, in keeping with the very short chemical reaction time between treating agents and distillates that may be allowed.

The particle size of the treating agent must be reduced to a minimum, so as to present, in the form of tiny particles or spheres, a maximum exposed surface per unit volume of the treating agent.

The dispersion contactor illustrated is a machine equipped with a screw propeller (surrounded by a circulation tube) for impressing high velocity flow to the liquid within the machine. Dispersion and intimacy of contact are accomplished by frequent changes in the velocity of this stream and by



"Stratco" dispersion contactor for application to vertical tanks for maintaining mixtures or oil blending

frequent enforced changes in the direction of flow, all of which occurs within a zone of controlled, turbulent flow.

These dispersion contactors are fitted with primary mixing heads wherein the entering stream of distillate is intimately mixed with the treating agents introduced. The discharge nozzle of the treating agents may consist of atomizing nozzles of various types. The mixed liquids then pass, at high velocity, down along the axis of the circulation tube. There is a zone of high turbulence between the stationary shearing blades and the blades of the screw propeller on the inlet side.

As the liquid passes through the propeller its flow is accelerated. When the liquid leaves the propeller on the discharge side, the stream contacts with diffuser vanes by which it is straightened. The direction of flow is reversed at the bottom of the contactor and the stream continues its flow in a closed circuit through an annular space. Since the liquids fed to the contactor enter a down-flowing stream at its center in the zone of reduced pressure, all possibility of cross-circuiting is eliminated. The discharge from the contactor is withdrawn through a narrow annular slot which skins off the out-flowing mixed liquids around the entire periphery of the contactor shell.

These machines may be used for other purposes than treating, such as for continuous blending of liquids, or the blending of finely divided solids or gases with liquids. In all cases the power consumption is small.

Summarizing the above, it is at once apparent that a modern treating plant occupies little space and requires a total volumetric capacity of only a few gallons for large charging rates. Conversely, the distillate, in passing through each acid stage, comprising contacting and separation by centrifuge, requires not more than a few seconds for desired chemical reaction or even less.

Such a plant can be easily regulated to optimum treating temperatures and desired flow rates of distillates and treating agents and it will then function automatically, discharging to storage products uniformly treated.

Dispersion and contacting machines have been perfected which produce almost colloidal mixtures or suspensions within surprisingly short periods of time. In many instances, chemical reactions can be completed, in these machines, within a fraction of a second, at ordinary temperatures.

The object of this type of treating plant is to make possible the elimination of expensive rerunning of cracked and point gasoline after treating and the necessity of making, treating and finally rerunning pressure distillate.

The systems and contactors shown are those developed by the writer and disclosed in patents issued and pending.—Editor.

Locke Returns From South America

BUENOS AIRES.—The inspection trip to South America embarked upon by George D. Locke, vice president of Barnsdall Refineries, Inc., Chicago, several weeks ago, was brought to a close on Feb. 6, when Mr. Locke set sail for the United States. He returned by way of Chile and the western coast of the Americas.

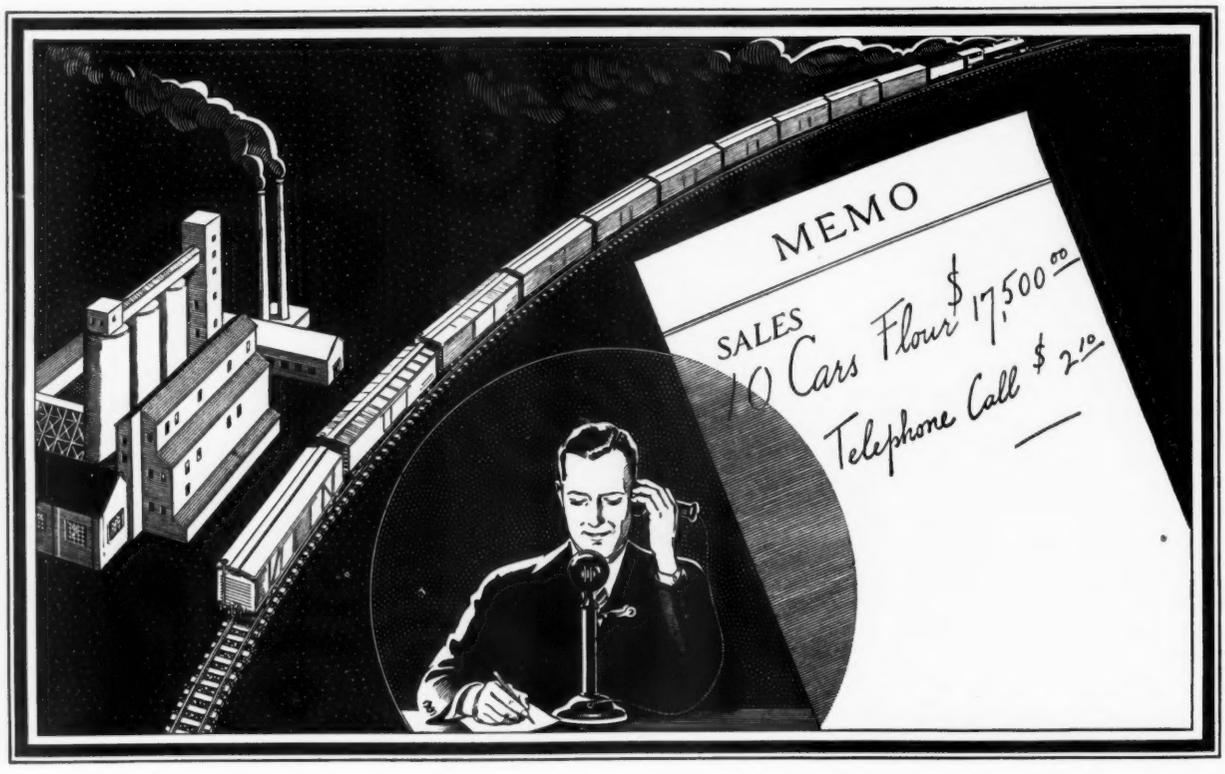
Mr. Locke, in an interview with a newspaper reporter of the Buenos Aires Herald, told of oil conditions in the United States.

One of the chief objects of his trip was to visit the Barnsdall agent in Buenos Aires, the Boley S. A. Introductora. The latter company has been representing the Barnsdall company since 1922.

Mr. Locke traveled in many important South American cities, in such countries as Argentina and Chile, in addition to Brazil.

NEW YORK, March 10.—The Kendall Refining Co., of Bradford, Pa., has opened a New York office at 222 W. 42nd st. Export sales of lubricants and other commodities and business pertaining to national accounts will be handled through this office, according to C. C. Fuller, of Bradford, manager.

He Closed a sale for 10 carloads of flour by Telephone



THE SALES MANAGER of a Columbus, Ohio, flour company placed a telephone call to a customer in Roanoke, Virginia. In less than four minutes he sold ten carloads of flour valued at $17,500. Cost of call, $2.10. In one month the telephone expenditure for the company was $65 and brought in orders for approximately $300,000 worth of flour.

Telephone calls between distant cities are increasing sales for all types of concerns. A coal wholesaler of Abilene, Kansas, sells 90% of his tonnage by telephone, and increases his sales each year. During the spring storage-taking period, he reaches out by telephone and sells from twenty to one hundred carloads of coal a day.

Business by telephone is the growing economy today. A Decker, Indiana, fruit company distributes 80% of its volume by telephone. An oil company of New York, Pennsylvania and Ohio does 95% of its annual business—$3,000,000—over the telephone.

What percentage could you add to your business by telephone contacts? Ask your local Bell Business Office to help you survey your needs. You may be overlooking telephone opportunities for increased business. Bell Telephone Service is . . . *Convenient . . . Economical . . . Universal.*

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BELL SYSTEM

Tests of Western Kansas and Oklahoma Are Wildcats of First Order

By William F. Lowe
N. P. N. STAFF WRITER

TULSA, March 8

WILDCATTING in western Kansas and Oklahoma moves apace and many of the tests are reaching interesting depths. Behind the activities are several urges that have served to keep more and deeper holes going in these two areas for several months. Many have been going intermittently for nearly a year, though the major portion of them are comparatively recent developments.

One of the chief reasons for the existence of these wildcats is the desire of the operators to either prove or disprove the large blocks of acreage they hold. Block leases in western Kansas, of which there are any number of unusually large size, were ageing to the point of renewal time. They had to be drilled or the acreage released. It was a forceful argument and the resulting pressure caused a large number of the wells to be started.

The recent discovery of "Siliceous lime" production in Rice and Russell counties, where it was thought to be considerably deeper than found, was another incentive. Western Kansas had been regarded as expensively deep and very doubtful for a number of years. This was because the usual Siluro-Devonian section of the eastern part of the state was thought to be present below the Pennsylvanian rocks in the western part as well. Remnant portions of it are found, but even where these do appear the well depths are much less than it was first anticipated that they would be. This was an encouraging indication.

Surface structures had proven tricky and in many cases were not the reflection of buried structure, and a pessimistic view was taken of the whole area. But as more and more geologic information was taken from wells, some of the old prejudices against the territory were removed. Coupled with the fact that the western half of both Kansas and Oklahoma are about the last remaining unprospected areas in the Mid-Continent, the present large number of wildcats seems but a natural move.

Along the southwest line of Kansas and into northwestern Oklahoma is a territory that still is expensively deep. The lower beds, in which the pays might be expected, dip at a rapid rate to the south and southwest toward the great Anadarko basin, which lies between the Wichita Mountains of southern Oklahoma, the buried granite ridge of the Texas Panhandle and the ridges of Kansas. Here the normal section of the pre-Pennsylvanian beds, so familiar to the operators of Oklahoma, thickens below an increased overload of Pennsylvanian and Permian sediments. The result is that the Wilcox and Arbuckle pays are progressively deeper and more inaccessible to the southwest.

In this part of Oklahoma, two wells, the Sinclair Oil & Gas Co. No. 1 Howell, 14-26-24, Harper county, and their No. 1 Stewart, 33-27-16 in Woods county, occupy the wildcat spot light of the Mid-Continent. Both are located on core drilled structures and have reached sufficient depths to indicate a normal sequence in the lower section.

The former is drilling in Mississippi lime at 7561 feet, though the latter has passed through this formation and found a gas show in the Chattanooga shale. Both wells indicate a decided thickening of the Mississippian, finding from 600 to 700 feet where the usual thickness is around 200 feet. It is to be hoped that the beds immediately below do not thicken in the same ratio.

Other important wells in the neighborhood are the Bu-Vi-Bar, Gypsy et al. No. 1 Fee, 10-25-15, Woods county and the Prairie Oil & Gas Co., No. 1 Wilbur, 23-23-17, in Woodward county. The former is shut down at 6104 feet and the latter is drilling at 6150. Both of these wells will have to go considerably deeper if they are to reach the pays they are seeking, namely the Wilcox and the "Siliceous lime." This is particularly true of the Prairie well.

There is no reason to believe that the Oklahoma City pool is the western frontier of the state for production from its type of structure. In fact the reverse is true, for there is plenty of evidence of deep seated folding resulting from regional tilting of beds. The search for another such structure is responsible for the present western drive. If it is found, it will be one of the country's deepest producing areas with a cost per well requiring an enormous flush production to make development worth while.

Western Kansas has one advantage over that part of Oklahoma in being, for the most part, considerably shallower. It is cheaper to wildcat and seems to have about as good possibilities. It has more dry holes to its discredit but each of these has contributed to the fund of geologic information that is necessary to make the average better in the future.

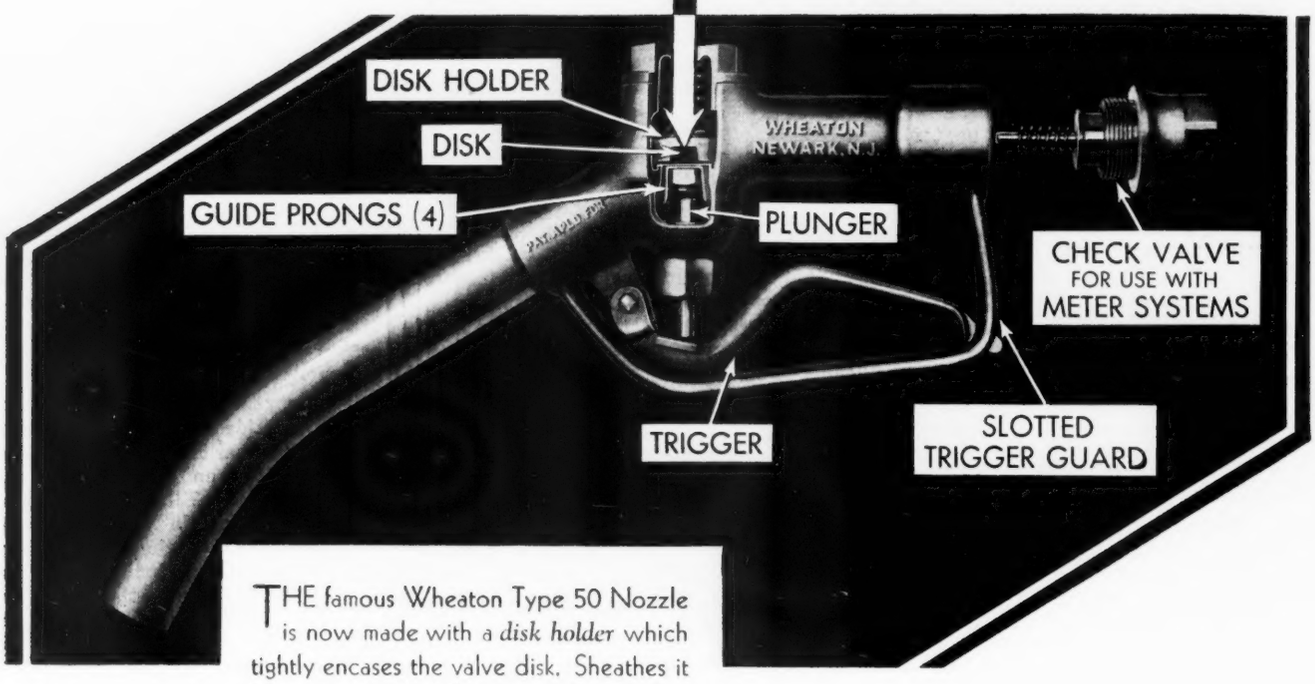
The county having the greatest number of outside tests of importance is Reno, in central Kansas. Here the wells are located on the two arches, the Barton and Ellsworth, which have been responsible for structure and oil in several of the neighboring counties. Only one of the wells is below 4000 feet. This test, the Gypsy Oil Co., No. 1 Hudson, 27-24-10, is now drilling in sandy lime at 4565 feet.

Rice county, which is due north of Reno county, is to get a test between the new Shurr pool, of the southwestern corner of the county, and the Sellens area of southern Russell county. Both the above pools are "Siliceous lime" producers and the No. 1 Plogg of Tatlock et al., in 33-18-9W, should bring out some interesting data on any connection between the pools.

Edwards county has three important tests in the Dixie-Amerada No. 1 McCarty, 22-25-17W, Barnsdall, No. 1 McCarty, 31-25-17W, and the Skelly No. 1 Johnson, 21-26-17W. All are on a major arch and sufficiently far south to find a portion of the Simpson, with a shot at production from the erosional conglomerate zone at the base of the Pennsylvania or the "Siliceous lime." They are drilling at 4106, 4130 and 4375 feet respectively and should be getting to completion depths in the near future.

A glance at the accompanying list of wildcats in the western part of the two states brings out who is doing the prospecting. Most of the names of companies and individuals that are given, seem to offer arguments in favor of the utter condemnation of the so-called Independent for reaching after more production at this time. Only a few of the wells listed are being drilled under the name of

THE DISK LASTS MANY TIMES LONGER



THE famous Wheaton Type 50 Nozzle is now made with a *disk holder* which tightly encases the valve disk. Sheathes it from saturation! Protects it from disintegration! Makes it *last* many times longer!

In the cut-out view above, you will observe that the disk holder almost completely encases the disk. Notice, too, the disk seat and the groove into which the rim of the disk holder slips as the disk wears down —assuring remarkably long life of the disk and freedom from a leaking valve.

Here is the finest auto-filling nozzle with the *longest-lasting* disk. It saves many a replacement. Send for a sample. Test it for 60 days. If it does not prove entirely satisfactory, return it for full credit or refund.

A. W. Wheaton Brass Works, Newark, N. J.

This LATEST IMPROVEMENT puts the WHEATON nozzle FURTHER IN THE LEAD THAN EVER

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a major company. The rest look like there were a lot of individual operators who were trying to flood the market with new production.

If the truth were known concerning the operating agreements under which these wells are being drilled, however, it would be found that about 98 per cent of them are financed by group backing of the "majors." It is the only sensible way to do it, and the responsibility for the discovery of another great flush pool cannot be placed entirely at the door of the Independent.

In the tabulation of wildcats, the numerals refer to feet in depth, S. D. means shutdown, Dr. means drilling.

Important Wildcats in Oklahoma And Kansas

North-Western Oklahoma

Alfalfa County

Bailey No. 1 Acres 14-24-11 S. D. 4660—Smith Bros. No. 1 Acres 12-27-11 S. D. 1420.

Blaine County

Bowen et al No. 1 Laster 27-16-11 S. D. 500—Washoma No. 1 Phillips 13-19-10 W. S. D. 2945.

Dewey County

Bailey & Slick No. 1 18-19-18 Spud & S. D.

Garfield County

Martin No. 1 9-24-6 W. Dr. 5566.

Grady County

Bailey No. 1 Robinson 1-10-6 W S. D. 1250.

Harper County

Empire No. 1 Bruce 12-20 Spud—Sinclair No. 1 Howell 14-26-24 Dr. 7561.

Kingfisher County

Gault-Brown No. 1 Campbell 6-16-7 S. D. 6015.

Major County

Earl et al No. 1 23-20-14 R. U. S. D.

Woods County

Sinclair No. 1 Stewart 33-27-16 Dr. 6775—Earl Miller No. 1 Copenhane 18-24-13 Spud S. D.—Bu-V-Bar-Gypsy & Prairie No. 1 10-25-15 S. D. 6104.

Woodward County

Burgoyne No. 1 15-21-19 T. D. 1910 S. D.—Harris-Haun No. 1 Watt 9-23-20 5660 D. & A.—Ostot No. 1 Sermons 32-24-17 S. D. 1400.

Kansas

Barber County

Robertson No. 1 Carlyle, C SE SE 11-32-10 W Dr. 3993—Barbara Oil No. 1 Lanker, C SW SE 1-33-13 W Dr. 4476—Barbara Oil No. 1 Alexander, C NW NW 23-33-13 W Dr. 1300—Skelly No. 1 Temple, SW SW NE 13-34-15 W Dr. 4950—Phillips No. 1 Powell, SE SE 11-32-10 Dr. 3993.

Barton County

P. O. & G. No. 1 Davidson C NW NW SE 4-16-11 Dr. 2635.

Clark County

Watchorn O. & G. No. 2 Morrison C NW NE 22-32-21 Dr. 6065.

Edwards County

Dixie & Amerada No. 1 McCarty C SW SW SW 22-23-17W Dr. 4106—Barnsdall No. 1 McCarty C NW NW NE 31-25-17W Dr. 4130—Skelly No. 1 Johnson C NE NE SW 21-26-17W Dr. 4375.

Ellis County

Byrens et al No. 1 Fisher S SW SE 4-11-20W S. D. 850—Cont. Commercial No. 1 Helms C SE SE SE 2-12-20 Loc.—Sterns-Streeter No. 1 Keiker SW NE 26-13-20 S. D. 1350—Barfield et al No. 1 Gatewood C NW NW 4-15-20 Dr. 300—Phillips No. 1 Owen SE SW 32-11-17 R. U.—Phillips No. 1 Ruth SE NW 32-11-17 R. U.—Phillips No. 1 Clinton SE NW 5-12-17 Dr. 825—Texas No. 1 Shutts NW NE SE 5-12-17 Rig—Phillips No. 1 Schneidler SE cor 18-12-17W Dr. 2935—Davis et al No. 4 Weiland SW NE NE 1-13-16 Rig.

Ellsworth County

Tatlock et al No. 1 Hertwig C SW SE 25-17-9 S. D. 3228.

Ford County

Swain et al No. 1 Henthorn C NW 21-25-24 S. D. 840—McNabb No. 1 Fowler C SE 26-27-22 S. D. 400.

Harper County

Beeler et al No. 1 Bear C NE 21-31-6W S. D. 1830.

Hodgeman County

Phillips No. 1 Houseman C NW NE NE 30-22-22 Dr. 5034.

McPherson County

Gault-Brown et al No. 1 Ziettlow C NE SE SE 7-17-1W S. D. 2020 T. D.—Simmons & Canary No. 1 Anderson C SW SW 14-17-1W R. U.—Howard Mavers et al No. 1 Comelson SWc 7-21-4W Top Viola 3940 H. F. W. 3945 Dr. 3946.

Morton County

Argus Prod. No. 1 Armstrong C NW 16-34-39W R. U.

Norton County

Richards et al No. 1 Colby C SW 17-42-1W Rig.

Pawnee County

P. O. & G. No. 1 Black SWc NE NE 11-20-18W Dr. 3835—Amerada No. 1 Welch C SE SE 30-21-17 Dr. 1270.

Pratt County

O'Haver-Jones et al No. 1 Gerlke C NE SW 7-26-14 Dr. 4160—Wilcox No. 1 Batton C SW SW NW 7-26-15 Dr. 2785.

Reno County

McCulloch Oil No. 1 Olson C SE SE NW 14-22-6 Dr. 3557—McBride et al No. 1 Bacon C SW NE SW 36-23-6W Spud—Skelly No. 1 Trebley C NE NE SW 30-24-7W Sp. to 2300 to test gas—Gypsy No. 1 Hedron C SE NE 27-24-10W Dr. 4565 Sdy. Lm.—Shell-Tatlock et al No. 1 Town C NW NW 17-25-4 Dr. 160—M. M. Valerious No. 1 Stevens C NE SE NE 6-26-7W R. U.—Vernon O. & G. No. 1 McPheeters S½ NW 22-26-8W Top chat 3935, S. D. for orders 3940.

Rice County

Tatlock et al No. 1 Plogg C SW SE 33-18-9W R. O. G.—Danciger No. 1 Bell C SW¼ 16-19-8W Dr. 3180—Tatlock et al No. 1 Ralston SWc 25-19-8W Cellar—Derby No. 1 Johnson C NW NE SE 24-20-6W Top chat 3295-97 S. D. orders—Bugher et al No. 1 Fair C SE NE NE 14-21-10W Dr. 2660—Boucher O. & G. No. 1 Boy SW SW SW 16-21-10 S. D. 2553 T. D.—McCulloch Oil No. 1 Williams Cent NE¼ 35-20-8 Dr. 700.

Rooks County

Krenzer et al No. 1 Stites NW SE SW 12-9-16 S. D. 570.

Rush County

Milmack Oil No. 1 Mohr NW¼ 11-18-16¼M gas 2350 Dr. 2690—Skelton et al No. 1 Andrews C NE SW 9-18-18W Loc. Danciger et al No. 1 Neve NWc 26-17-17 S. D. 3608 for orders.

Russell County

Gilbreath et al No. 1 Bratton C NE¼ 33-11-13W Dr. 180—Griffiths et al No. 1 Mansfield SE SE SW 16-12-13W Top Oswald 2814, Cong 3451-69-H. F. W. 3469 T. D.&A.—Marland Inc. No. 1 Maier NE NE NW 8-15-14W Dr. 1110—Empire No. 1 Krug SW NW NW 24-15-14 Dr. 1610.

Sheridan County

Mandolin O. & G. No. 1 Shoemaker SE SW SW 27-7-26 Spud S. D.

Stafford County

Gibson et al No. 1 Meuller SW¼ 11-23-14W Dr. 3705.

Stanton County

H. L. Brown No. 1 Santa Fe Del. Co. SW¼ 11-29-39 S. D. 450.

Stephens County

Moody-Segraves No. 1 Hobble SE¼ 17-32-37 ¼M in sdy. Lime 2610-25—Mangle No. 1 Hickok C SE NW 23-32-39 Spud & S. D.—Argus No. 1 Smith C SW¼ 13-33-37 Dr. 1 1041—McNabb et al No. 1 Ramsey SW¼ 11-33-38 Dr. 1480—Argus Gas No. 1 Parker NE¼ 30-34-36 Dr. 485—Sidwell et al No. 1 Kelly SE SE NW 16-34-38 S. D. 1325—Trees Oil Co. No. 1 Lowery C SE¼ 4-35-38 Loc.

Trego County

Day et al No. 1 Eaton NE NW SW 2-11-21W Showing gas 3688, Dr. 3820—Day & Chester No. 1 Gugler SW NE NE 36-12-21 Rig—Dixie-Amerada No. 1 Reitmeyer NE NE 19-14-21 Dr. 3300—P. O. & G. No. 1 Kutina NE SW NE 29-15-21 Dr. 4296.

Arizona "U" Has Free Oil Course

TUCSON, Ariz.—A short course tending to give dealers and consumers of petroleum products some background of petroleum geology and refining, was given during four days of February at the University of Arizona here.

Any one desiring to do so was given the opportunity of bringing in gasoline or oil samples, without designation, to be tested either by the laboratory officials or by the individuals themselves under the laboratory's supervision.

The course was free of charge. It consisted of a series of lectures by G. M. Butler, dean and director of the university, and M. L. Thornburg, professor. Origin of petroleum and elementary geological facts were presented in a lecture on oil geology by Mr. Butler, while Prof. Thornburg discussed the theory of lubrication, economics of automotive engine developments and adjustments, the special needs of automotive engines, and gasoline.

Magnolia Pipe Line Runs Dec. and Jan.

Houston, Mar. 10—Magnolia Petroleum Company, pipeline department, announces from Dallas headquarters the following crude oil runs for January, which are shown in comparison with December.

	December	January
Hewitt-Graham	175,513.68	157,086.55
Healdton	193,326.73	165,851.69
Cushing	100,863.10	91,973.30
Yale	40,479.67	36,954.93
Augusta	33,955.01	32,290.27
Wewoka	544,705.67	564,459.45
Seminole	41,839.11	42,049.50
Oklahoma City	136,740.96	211,777.56
Wewoka—Bright Stock	.....	85,869.93
Total Okla.-Kans.	1,267,423.93	1,388,313.18
Archer	19,144.28	19,359.17
Burkburnett	61,721.69	56,640.08
Comanche	15,969.39	13,422.97
Electra	77,714.08	73,069.50
Corsicana—Heavy	8,419.46	6,598.58
Corsicana—Light	10,563.31	7,859.16
Henrietta	1,883.53	1,110.92
Iatan	15,906.47	13,449.93
Luling	279,097.77	271,110.23
Lytton Springs	26,310.14	26,494.71
Mexia-Wortham	18,092.13	17,990.92
Mirando	185,760.86	188,808.13
Olden	8,258.34	6,481.47
Panhandle	128,195.47	143,702.21
Panola	1,351.26	693.60
Stephens	7,476.04	7,397.68
Thrall	1,310.15	972.38
Crane-Upton	64,866.93	63,255.92
Glasscock	48,715.17	47,609.37
Winkler	58,465.45	40,407.26
Darst Creek	2,974.59	110,454.73
Winkler County (S.C.O.P. Co.)	.....	2,986.52
Total Texas	1,042,196.51	1,119,875.44
Haynesville	4,884.35	6,376.57
Bull Bayou	34,433.42	32,673.04
Cotton Valley	33,024.82	27,039.85
Pine Island	24,373.99	22,755.84
Hackberry	30,400.00	18,287.87
Total Louisiana	127,116.58	107,133.17
El Dorado Light	6,095.07	.....
East El Dorado	3,255.56	3,399.59
Smackover	62,033.52	57,193.24
Rainbow	40,999.85	.....
El Dorado-Rainbow	.....	40,495.37
Total Arkansas	112,384.00	101,088.20
GRAND TOTAL	2,549,121.02	2,716,409.99

OKLAHOMA-KANSAS

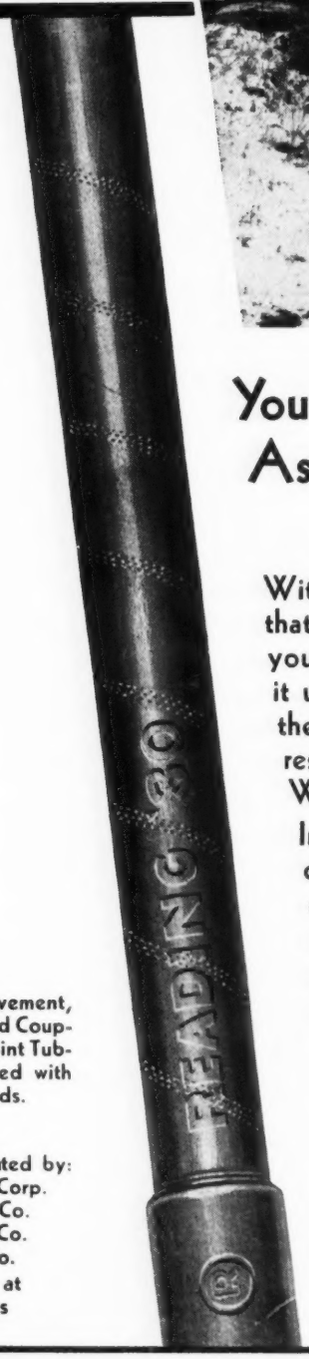
Report for January		Daily Avg.
Runs	1,925,246.00	62,105.00
Shipments	2,010,029.00	65,840.00
Total Stock	7,577,975.00	.....

TEXAS

Wichita, Wilbarger, Archer		
Runs	149,460.00	4,821.00
Shipments	165,251.00	5,330.00
Petrolia—Runs	1,111.00	36.00
Shipments	1,111.00	36.00
Eastland, Stephens		
Runs	27,316.00	8,811.00
Shipments	.....	.....

TOTAL STOCK—166,223.00—North Central Texas Field.

Reading 5-Point Pipe discharge line near Bradford, Pa., laid in 1888. Copy of above photograph will be sent to anyone desiring it upon receipt of 10 cents in coin or stamps.



Your Pipe Money Goes Twice As Far When You Cut Pipe Costs In Two!

With a known life at least twice longer than that of ordinary pipe, Reading 5-Point Pipe cuts your pipe maintenance costs in half! Figure it up on the basis of yearly pipe savings—then you'll know the economy of corrosion-resisting, strain-defying Genuine Puddled Wrought Iron Pipe in refinery service!

In wrought iron pipe, the word "puddled" means pipe certainty—certainty of proved performance tested by generations of use. That's why it is important to get the original, Genuine Puddled Wrought Iron, guaranteed by our name and indented spiral mark on every piece of Reading 5-Point Pipe.

As an added improvement, all Reading Galvanized Couplings for Reading 5-Point Tubing are now furnished with galvanized threads.

Reading pipe distributed by:
Frick-Reid Supply Corp.
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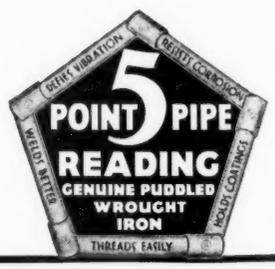


GENUINE PUDDLED WROUGHT IRON
READING PIPE
DIAMETERS RANGING FROM 1/8 TO 20 INCHES

Science and Invention Have Never Found a Satisfactory Substitute for Genuine Puddled Wrought Iron

AT THIS writing things are in a hess in Kansas. The legislature is in session, called by the governor to do something about the tax situation. Just before the statesmen came together the supreme court laid down a decision that threw everything into confusion and nobody knows how the state will function.

The court held, in the case of Voran vs. the county treasurer of Shawnee county, that, since there was a law in the state taxing monies and credits at the low rate of 25 cents on each $100 value, the state could not impose a general property tax, which ranged up to $3.50 per $100, on the stock of national banks. It reasoned that under Sec. 5219 of the revised statutes of the United States, Congress permits the stock of national banks to be taxed at a rate not exceeding that assessed upon other monied capital in the hands of citizens of the state, coming into competition with the business of national banks.

Therefore, said the court, in view of all this, since national banks cannot be taxed at a rate higher than the intangible tax rate, state banks would have to come under the same rule because of the uniformity clause in the state constitution. This, naturally, would result in a large loss of revenue to state and local taxing authorities. The governor, in his message, said that if that condition were true as to bank stocks, it would be true of all other property—that it all had to be taxed at not to exceed the low intangible tax rate. Which would leave everybody very much up in the air and the state and counties and smaller political units without funds to carry on their business.

He recommended that the legislature repeal the intangible tax law, the secured debt law and the mortgage registration law, thus putting all property on the general property tax rate. The Senate acted favorably on this proposal and as this is written, it is expected that the House will do the same. While the legislature was deliberating these matters, the high court handed down another opinion, denying the application of some people who sought to reduce the real estate tax to the level of the monies and credit tax. The court thus gave the legislature a breathing spell in which to mend the general situation.

It will be remembered that one of the recommendations of the governor's tax code commission was a gross production tax on oil. Relying upon that uniformity clause in the constitution, the oil people contend that, if a gross production tax is placed on oil, it must be applied in the same amount to coal, salt and any other minerals. An attempt to introduce a constitutional amendment removing the uniformity clause was beaten. They don't want to tax coal, so it looks as though the oil industry would escape also.

* * *

W. H. Tolhurst, chief engineer and master mechanic for the Standard Oil Co. of Indiana at Casper has left that position to devote full time to a gold mining proposition in Fremont county, Wyo. He is the representative of financial interests which have made a substantial investment in properties said to be proven in value.

* * *

Wichita, it is reported, is to get a "skyscraper." Plans are on foot for a 25-story Petroleum building and it is the intention to coax oil companies to occupy the building. In connection with this, a new bank is to be organized to occupy the ground floor.

* * *

W. R. Ramsey, head of the Ramsey Petroleum Corp., Oklahoma City, has come out in the newspapers in opposition to unit operation of oil fields via the acreage pooling plan. Principal reason given: Restriction of individual enterprise. His remedy for the troubles of the oil business: Tariff and curtailment to level of demand.

* * *

James M. Hawkins, land man for Tom C. Johnson, Wichita operator, recently underwent an operation for appendicitis.

* * *

There is no oil on the townsite of Marland, Okla., but the town council has enacted an ordinance to cover all contingencies in the event anyone ever does find oil. Drilling permits, costing $100 each, will be issued by the town board; operating companies must post $15,000 bond; only one well may be drilled within any block and at least 60 per cent of the townlot owners in a block must give approval. An interesting provision is that the one-eighth royalty shall be shared by property owners in the proportion each one's land bears to the total area of Marland townsite.

* * *

W. L. Connelly, head of the foreign operations for the Sinclair interests, sailed recently for Venezuela. He will complete arrangements for the starting of one or more tests on the large holdings of the Sinclair.

* * *

J. J. Deaner, oil producer, Okmulgee, has purchased the handsome home of E. R. Black in that city. Mr. Black, who is also an oil producer, will live in an apartment building which he owns.

* * *

Died: John H. Murphy, freight traffic manager for the Prairie Pipe Line Co., in Independence, Kans. He entered the employ of the company in 1908. His widow survives him.

* * *

Mack Harlow, formerly of the information service department of the Empire Companies, Bartlesville, is assistant safety engineer of the Indian Territory Illuminating Oil Co. R. B. Walter, chief safety engineer, is devoting full time to the Oklahoma City field and Mr. Harlow will supervise safety work in the Seminole district. He has had previous experience in this work, having been in charge for three years for the Empire at the Okmulgee refinery.

* * *

Married: Miss Marjorie Smith, Chanute, Kans., and Homer Charles, geologist for the Indian Territory Illuminating Oil Co., Bartlesville.

* * *

Ten Years Ago

(From National Petroleum News, March 10, 1920)

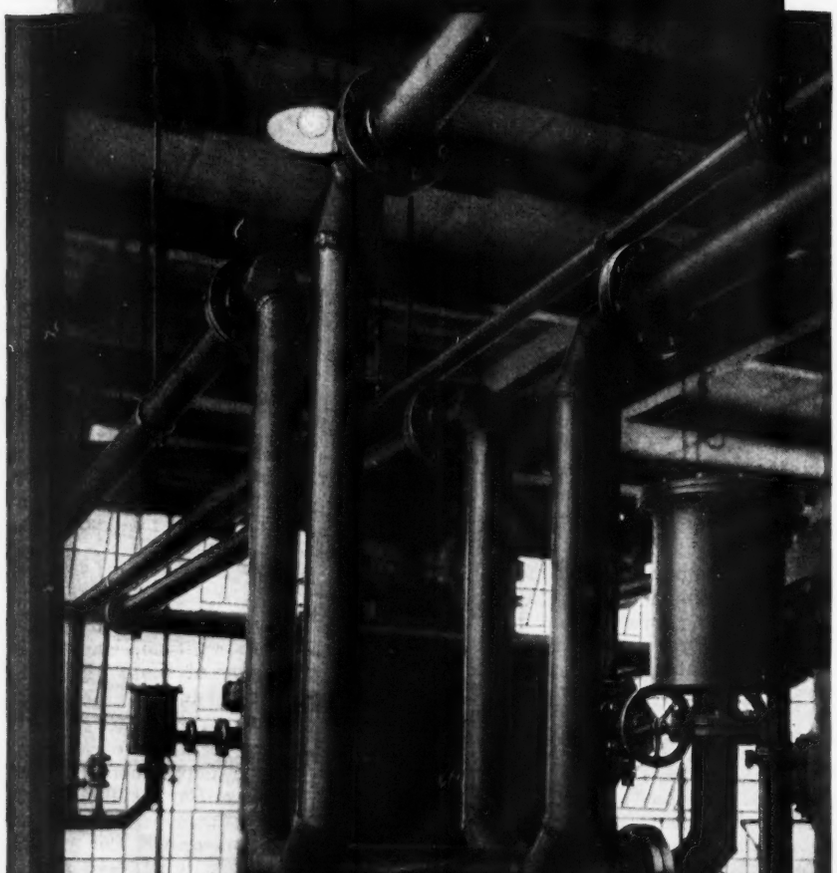
Independent refiners in Pennsylvania reach agreement with South Penn Oil Co. which assures continuance of supply of crude oil. Samuel Messer designated as agent of refiners to distribute crude allotted to them.

Seward R. Sheldon becomes editor of Marland Oil Co. publication. (Mr. Sheldon later became treasurer of the company.)

Murray M. Doan elected vice-president and general manager of Phillips Petroleum Co.

Joseph M. Cudahy elected president of Sinclair Refining Co.

WELDED Industrial Piping



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—From an Editorial in **POWER**

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More New Production to be Prorated Is Mid-Continent's Latest Showing

By William F. Lowe
N. P. N. STAFF WRITER

TULSA, March 8

CONSIDERING the fact that the oil industry of the Mid-Continent is supposed to be sick, the developments of the past week indicate that it is not only a fairly active, but an irrational invalid. It kicked around this week and found a lot more of the stuff that gave it the original colic.

Oklahoma fairly shook itself and broke out in several unexpected places. The Konawa pool of Seminole county was extended in two directions, while the Cement pool in the southwestern part of the state was finding a new sand that will double the production. Oklahoma City added 10 new wells to the proration waiting list and some 70,000 barrels to the present daily potential, thus further complicating the troubles in that area. Seminole just rocked along with only one well worth boasting about and that one owes its distinction to the fact that it is producing from the Viola instead of the Wilcox.

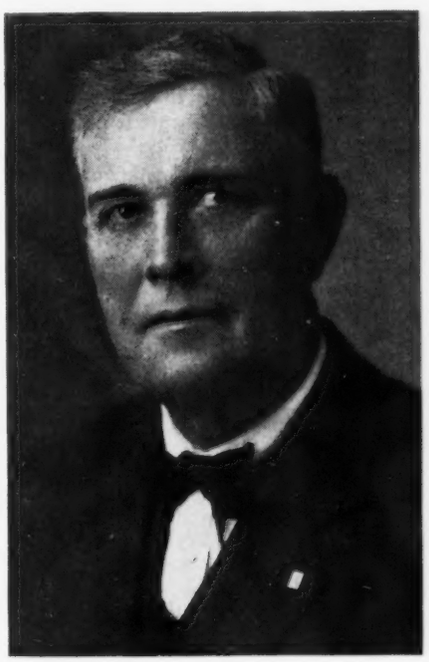
In Kansas the Voshell pool spread out in three directions while two of the inside wells were coming in for more than 1,000 barrels apiece. One of the new extension wells, the Dixie-Amerada No. 1, Voshell, NE SE NW, 9-21-3W, moves the western edge of the pool out one half mile, and the well looks as good as the inside locations.

The Texas Panhandle seems not to have been so interested in getting more oil as in the generation of indignation over new proration or shut-in. The operators meeting in Pampa recently must have been a darb from a spectator's standpoint if the reports are to be relied upon. It seems that somebody was not willing to trust somebody else, or something like that, though some good ideas came out of the discussion. Anyway, some sort of scheme calculated to slow up operations in the whole district is about to be hatched.

At Konawa, the Hilton Phillips No. 1 Hyde, SE NE, 20-6-6E, is the most spectacular of the three wells that were completed there this week. Bottomed in the Cromwell sand at 3118, the well flowed 1050 barrels in 17 hours. It extends the pool one mile to the south. In the same neighborhood and making the southern mile extension more of a certainty, the McCulloch No. 1 Enlitka, NW NE SW, 16-6-6E, was deepened from 2928 to 2934 feet and began flowing by heads, making 605 barrels on the first gauge. One and one half miles southwest of the pool, in 19-6-6E, Anderson & Kerr brought in a well that gauged 335 barrels the first six hours, at a total depth of 2840 feet.

There have been several other wells brought in in the Konawa district and others are hurrying with undue speed to at least get some grease on the floor. Lease terms are getting plenty short in that part of the country and one operator managed to bail out a little oil about 20 minutes before his lease expired. That's drawing the line pretty fine but it is rumored that he held it on that showing.

Oklahoma City poured it on during the past week and 10 wells swelled the field's potential some 70,000 barrels per day. Four of these were "Siliceous lime" wells and six were sand wells. Two others, both in the sand, have a combined gas capacity of 200,000,000 cubic feet. It won't be long now before the gas of this pool is put to some use, for the Empire is planning a pipeline with a capacity of 150,000,000 cubic feet to take some of the gasoline plant residue.



Charles Shuman, Sinclair Oil & Gas Co. Mr. Shuman was recently elected chairman of the Drumright, Okla., chapter of the American Petroleum Institute, Division of Production

The largest of the 10 completions for the week at Oklahoma City is the Indian Territory Illuminating Oil Co.'s No. 2 Fuzzell, 13-11-3W, which gauged 8630 barrels in 12 hours from a total depth of 6484 feet in lime. This brought the total number of completed producers to 129.

The new proration program that was put into effect last week is making itself felt in a large way. From more than 80,000 barrels a day for the previous week, the past seven days has seen the daily average drop to 38,600 barrels from the 18 wells allowed to produce under the new plan. The Texas and Tidal Oil Companies intimate that they may enter the field with new lines, in which event, there will be some little relief from the present shut-in methods.

In the old Cement pool of Caddo county in the southwestern part of the state, a deepened well upset the dope that has stood for some time. The Magnolia Pet Co., No. 6 Caddo-Rowe, SE NE SW NE, 36-6-10W, found a new sand from 3291 to 3300 feet that boosted the production of the old well from 150 barrels to 850 barrels per day. The present total depth is 3327 feet, the well having been deepened from 3230 feet.

East Earlsboro in Seminole county had a spectacular producer in the Prairie Oil & Gas Co., No. 5 Baker, SE SW NE, 24-9-5. It is producing from the Viola instead of the Wilcox though it is completely surrounded by wells in the latter horizon. The first 24-hour gauge, however, sounds more like the wells in the lower sand for it made 4600 barrels in 22 hours, flowing on the gas lift.

Two outside locations, aside from the one already mentioned, helped the Voshell pool of McPherson county, Kansas, to grow a little bigger. On the northeast, the No. 1 Krehbiel of the Gypsy Oil Co., in the SW SW SW, 3-21-3W, swabbed 272 barrels in six hours and only lowered the fluid column about 600 feet. The pay is from 3424 to 3428 feet in a green sandy shale. The No. 1 Katy of the

same company in the SE SE SW of 4-21-3W, had the "Wilcox" from 3458 to 3468 feet and swabbed 325 barrels in 10 hours. It extends the pool two locations to the northwest.

The Ritz pool of the same county was stretched a mile to the north when the Shell-McPherson No. 1 Koehn 12-20-2W, came in for 60 barrels an hour. The pay is in the "chat" which was topped at 2934 feet. At a total depth of 2974 feet the well began flowing, making 171 barrels in the first two hours.

Over in the Texas Panhandle the largest well of the week is the least impressive. Though it is making 965 barrels on the swab, the No. 7 Palmer, of the McMann Oil & Gas Co., in section 31, Block B2, H&GN Survey, Gray county, is only a little below what was expected of an inside location in the Finley pool. It does illustrate again, however, that drainage from offsetting wells is often a very exaggerated loss, for it is about as good though six months behind its offsets.

Six miles east of Lefors and one mile north of any other production in Gray county, the 50-barrel well of Smith & McDonald is much more important. Located in the SE NE of section 49, Block A9, H&GN Survey, it is producing from dolomite, a formation which, in the Panhandle as well as in other localities, is noted for its slow decline and large ultimate recoveries.

Operators of the Amarillo district met in Pampa this week to discuss new methods for restricting production as well as drilling, the former proration program having run its 30-day course. There was considerable dissension on ways and means but out of the meeting came the proposal to submit the difficulties to the state railroad commission. If a new plan is put into effect it will be made to cover the entire area instead of applying to Gray county alone.

Limiting Production Must Go On Reeser Tells Californians

LOS ANGELES, March 7

THE industry's voluntary proration program must not be given up, even though success has not been what was anticipated, E. B. Reeser, head of the Barnsdall Corp., and president of the American Petroleum Institute, told members of the California Oil & Gas Association, at the annual meeting here March 6.

"It seems to me we have overcome tremendous difficulties and made real progress," said Mr. Reeser. "Yet I realize that we are standing on the edge of a deep precipice. Will we yield to the lines of least resistance and give up all we have gained, or will we fight a little harder and gain that which belongs to the greatest basic industry in the world?

"Hand in hand, shoulder to shoulder, the directors, the executive and the petroleum engineer must go steadily forward until we meet with success."

About 1300 men identified with the oil industry in California attended the meeting which was the twenty-third annual banquet of the organization.

Among the data presented at the meeting was that the actual production in California amounted to about 900,000 barrels daily when curtailment efforts first were instituted, with Santa Fe Springs and Elwood fields both in the early stages of a drilling campaign that threatened to flood the western market with crude oil.

Herbert R. MacMillan, president of the organization, stated that although an effort had been made to reduce the states output during the last half of 1929 to the average daily production of 1928, California had produced more than 60,000,000 barrels last year in excess of the former year, and that total stocks in the state during 1929 increased 44,000,000 barrels. He added that during the six day test of possible production from the flush fields the state's potential daily yield had been established at nearly 1,100,000 barrels, whereas the market requirements call for only 611,000 barrels.

He urged the California operators to consider the interests of those engaged in a similar business in such highly potential oil areas as Oklahoma and Texas, and said that failure of the various parts of the country to take into account the problems of other parts would greatly hamper the development of the oil industry throughout the United States.

Mr. MacMillan also stated that California's oil fields are more productive than any other areas of equal size in the world, and that last year they furnished 29 per cent of the national output and 19 per cent of the world's production. Up until the close of 1929, he added, California had produced approximately 3,300,000,000 barrels of oil having a value of about $3,500,000,000. During 1929 nearly 500 companies operating more than 11,000 wells, produced over 292,000,000 barrels of oil.

Claiming that the oil industry on the Pacific coast with approximately 60,000 employees, who receive over $125,000,000 annually, is the leading industry of the state, he closed with the suggestion that every effort be made to obtain 100 per cent cooperation among the producers.

Conservation is worth while to the oil industry from any point of view, Mr. Reeser pointed out. From a selfish point of view, if pushed far enough, it would create a seller's market for crude. Again it helps to protect the future of the United States.

The smaller operator rather than the major companies, Mr. Reeser went on to say, have been drilling wells at a higher rate. A survey of all drilling wells west of the Mississippi river, as of Feb. 15, indicated that the major and the larger Independent companies, representing approximately 80 per cent of the production of the United States, were drilling only 34 per cent, whereas individuals and small companies with 20 per cent of the production, were drilling 66 per cent of the wells under way then.

An interesting feature he brought out was that in California 5792 wells had been drilled during the last five years, and yet, at the end of 1929, only 10,515 wells were producing, as compared with 11,069 producing wells five years earlier.

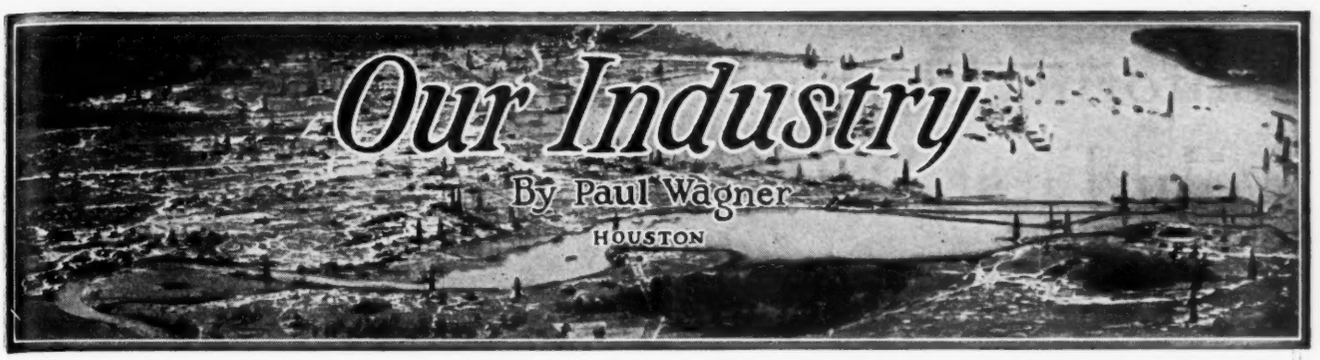
Producers recently have had to bear the burden of two outstanding elements: the simultaneous development of several great producing areas, an unusual occurrence and one which may not occur again, and during the same period tremendous progress made in refinery practice. Ten years ago, Mr. Reeser said, the average gasoline yield from crude run to stills was 25 per cent, while last year it was 39 per cent, an increase of nearly six gallons from each barrel run.

Production of crude in California has increased two and one-half times within nine years, while production of gasoline increased seven and one-half times, or from 33,000 to 250,000 barrels per day. Export and domestic consumption increased approximately four times during the same period.

LOS ANGELES—William S. Grau, formerly production superintendent of the Doheny-Stone Drill Co., Torrance, Calif., has organized the Morse-Grau Tool & Mfg. Co. here for the design and manufacture of special tools, gauges, jigs, reamers, boring bars, etc.

William S. Morse, owner of the Morse Counter Bore & Tool Co., Detroit, is president.

Previous to his connection with the Doheny company, Mr. Grau was for eight years production superintendent with the Union Tool Co., Los Angeles.



NORDON CORP., LTD., a Canadian organization which operates in the United States through the Nordon Co. of Delaware, Inc., expects to make its first oil test in the Buttonwillow district of California in the northwest quarter of 7-29-24, in the same section as the Milham Corp.'s No. 1 Salisbury. The Canadian parent organization, financed by a group of Vancouver and Toronto capitalists, is headed by Glen M. Rubey, formerly of the Hudson's Bay Marland Co., as president.

C. G. (Neil) Willis, formerly of the old Marland Oil Co. of Delaware at Ponca City and elsewhere, is president of the American subsidiary. Mr. Willis, who is in charge of Pacific Coast operations, makes headquarters at Los Angeles. Associated with Messrs. Rubey and Willis in the operating organization are Ben Hake, formerly chief geologist of the Hudson's Bay Marland Co., in Canada, and Robert B. Moran, Los Angeles consulting geologist, an American director. Robin Willis, geologist of Midland, Texas, and brother of Neil, is also active in the Nordon.

Jeff D. Farish has announced his resignation as general attorney for the Navarro Oil Co., Houston, to enter general practice. He is a brother of Steve P. Farish, president of the Navarro. Both are brothers of W. S. Farish, president of Humble Oil & Refining Co.

* * *

N. E. Tanner, now an independent operator of San Angelo, formerly represented the land and scouting departments of the Humble Oil & Refining Co., in parts of West Texas. He is a familiar figure in the Permian salt basin geological province, where he was one of the first scouts actively engaged in covering hundreds of square miles of territory weekly. Mr. Tanner has lived at San Angelo since leaving the Humble organization about two years ago.

* * *

Earl Hagy, formerly identified with the Byron Jackson Co., in South Texas, is now representing the Wilson Supply Co., as specialty salesman, in Gulf Coastal territory. He is widely known in equipment circles.

Frank Reiber, long identified with geophysical exploration work on the Pacific Coast, is president of the newly formed Reiber Instruments Corp., with offices in the Title Insurance building at Los Angeles. Associated with him as vice president is J. C. Ballagh.

W. Edward Lee, Midland, Texas, attorney, has been elected secretary of the Wickett Pipeline Co., a short line system connecting with the Wickett Refining Co. plant in West Texas. W. B. Hassett of Tulsa and C. R. Armstrong of Pittsburgh were re-elected president and vice president, respectively. John M. Shipley of Midland is also a director.

* * *

C. R. Worley, sales representative at Fort Worth of the American Cable Co., hereafter will make headquarters at the Fort Worth Well Machinery & Supply Co., its new North Texas agency.

* * *

C. O. (Ted) Collins, lease trader and oil operator of Fort Worth, is widely known in the North and West Texas land division of the petroleum industry. He has been active for years over a wide expanse of territory, making headquarters in the Fort Worth National Bank building.

C. O. (Ted) Collins

* * *

L. C. (Court) Decius, formerly chief geologist of the Associated Oil Co., San Francisco, has been appointed manager of that corporation's land and leasing department. He is a graduate of Stanford University and widely known in Pacific Coast geological circles. Announcement of his new position was made by James H. Jenkins, general manager of the Associated's production department.

* * *

Walter E. Hopper is now devoting all his time to the Southern States Co., Inc., of Shreveport, of which he is president. The company, in which he is associated with H. C. Otis, specializes in tubing high pressure oil and gas wells. Mr. Hopper recently resigned his connection with the Arkansas Natural Gas Corp.

* * *

C. A. Russell, vice president of the Republic Production Co., of the American Republics (J. S. Cullinan) group, divides his time between Gulf Coastal headquarters at Houston and West Texas headquarters at San Angelo. Mr. Russell spends most of his time at Houston, where general offices are located.

* * *

Ralph D. Reed, now in charge of the geological department of The Texas Co. of California, at Los Angeles, was formerly identified with the old Marland Oil Co. of California. He has been affiliated with The Texas Co., about a year and a half, succeeding to his present position on the resignation of Irvine Stewart a few months ago. Mr. Reed was graduated from Hiram College, Ohio, in 1913, afterwards took up graduate work at the University of Illinois and the University of Oklahoma, and later obtained his Ph.D. at Stanford University, Palo Alto, in 1922.

* * *

V. E. Cottingham, San Angelo geologist and operator, accompanied by his bride, formerly Miss Rose Vorpahl, have returned home after a honeymoon spent in Florida and Cuba.

California Output Held to 650,000 Barrels In First Week of New Proration

By Jack Westsmith
N. P. N. STAFF WRITER

LOS ANGELES, March 7

DAILY average production figures from California fields at close of week ended March 7 indicated that although state wide voluntary curtailment had been in effect for a week the state's output was still about 45,000 barrels in excess of 609,000 barrels daily set as the amount of crude the Pacific coast should produce to satisfy its market demands.

Small operators in the townlot areas of Santa Fe Springs, Signal Hill, Huntington Beach, Maricopa Flats, Alamitos Heights (part of the Seal Beach field) and major operators in the high pressure field of Ventura Avenue, have combined to keep the total daily output at 654,300 barrels during the first week.

Accurate determination of proration results will not be known until after the pipe line companies have completed their reports of daily runs and submitted them to the general committee headed by Paul Boggs of the Union Oil Co.

An accompanying table shows the daily potential production for the 14 fields under the jurisdiction of Umpire Paul Grimm, the daily allowable production for March 1 to 15 inclusive, total actual production, and the daily average production during the first five days of this period.

The total figures are somewhat ambiguous, as several of the fields have reduced their output below the allowable figure. Santa Fe Springs is shown to be flowing about 15,000 barrels in excess of its quota, Ventura Avenue approximately 2000 barrels above its allowable and Maricopa Flats a like amount.

On account of the high gas pressures at Ventura Avenue, operators there have had considerable difficulty in reducing the gas production to a level that would prevent a wastage of more than 10 per cent of the total outlet of 150,000, metric cubic feet per day. During February this field had a daily gas production of 208,929 metric cubic feet although being curtailed 40 per cent from a potential production of 352,302 metric cubic feet. The total potential for the month was 9,864,456 metric cubic feet with a total production of 5,850,027 metric cubic feet, a total blowoff of 1,759,387 metric cubic feet and a total outlet of 4,090,640 metric cubic feet during the month.

This field, which is supposed to be working in accordance with the State Oil and Gas Supervisor's orders under the California Gas Conservation Law, has been unable to bring gas wastage down to the desired figure. The failure of this field casts somewhat of a shadow on the possibility of enforcing the law in the highly gaseous field of Kettleman Hills, if it should survive the present legal tangle in the superior court.

DAILY PRODUCTION SUMMARY OF CALIFORNIA FIELDS UNDER SUPERVISION OF UMPIRE H. P. GRIMM

(All figures in barrels)

Field	Daily Potential Production March	Daily Allowable March 1-5	Actual Total Production March 1-5	Daily Av. Prod. Mar. 1-5 Inclusive
Elwood	64,579	36,810	184,004	36,801
Inglewood	23,245	18,596	91,150	18,230
Kern Front	22,626	12,897	61,903	12,381
Lost Hills-Belridge	8,630	2,090	10,450	2,090
Lawndale	700	700	3,500	700
Maricopa Flats	20,810	11,862	68,592	13,718
Montebello	9,200	6,716	38,714	7,742
Mount Poso	20,783	11,846	41,932	8,386
Playa Del Rey	1,900	Shut-in	.....	.....
Potrero	900	900	4,500	900
Round Mountain	7,570	3,785	14,223	2,845
Santa Fe Springs	271,197	144,960	795,488	159,098
Ventura Avenue	74,348	42,378	223,158	44,632
West Coyote	10,950	9,855	49,067	9,813
Total	537,438	303,395	1,586,681	317,336

An oil well that threatens to play an important part in development operations on the Pacific coast during the next few months was completed in the Midway-McKittrick area west of Bakersfield March 4 by H. L. Whiston, an independent operator.

This wildcat, on section 30-30-22, is thought to have penetrated the Upper Temblor zone—the productive horizon in the Kettleman Hills—at a depth of 5040 feet. It came in for an initial output of nearly 1000 barrels of 40 gravity oil with no cut, and is expected to have a production of over two million cubic feet of gas when it cleans up.

Numerous other tests of unknown and slightly proven areas on the Pacific coast are under way that may bring to light new additions to crude oil reserves. The Olympic Corp. reported to be backed by the Pacific Coast Steamship Co., of Seattle has leased 4000 acres on Otay Mesa, near San Diego, and an exhaustive search for oil sands is expected to be under way within six weeks.

On a production test made during the past week by General Petroleum Corp. in its More 1 well, completed several months ago at Goleta northwest of Santa Barbara, it was estimated that the project was making approximately 12 million cubic feet of wet gas and nearly 50 barrels of wet gas, per day. When the well blew in, bottomed at 4538 feet, as a gasser it was shut in because of lack of equipment to handle the output. Gas-traps have now been rigged up and preparations have been made to kill the well and run in tubing as it is flowing barefoot. General Petroleum's More 2 in the same area is suspended at 4434 feet due to heavy gas pressure and heavy mud is being used to prevent a blowout.

Supervisors of Santa Barbara county are attempting to stop further drilling of tideland wells on the beach at Carpenteria by use of a right of way granted in 1887 for an ocean highway. The highway was never built but it is claimed that the grant is still valid. A number of operators are drilling validation holes in this area with small water-well rigs in an effort to prove up before the county officials can bring action to stop them. An injunction issued by the superior court of that area restraining the operators from drilling was recently withdrawn and the operators allowed to continue.

Salvage yard of a Mid-Continent refining company

Salvaging the Junk Pile*

Specific Examples of How Refineries, Producing and Pipe Line Companies Reclaim Used Materials. Well Organized Salvage Work Found Profitable to Small Companies as Well as Large

By C. P. Bowie**

THE salvage department in the larger oil companies is usually conducted by the store division of the purchasing department. This branch of the organization has the best knowledge of the requirements of the operating divisions and it can provide proper distribution of the reclaimed materials along with new supplies.

A considerable variance in the bookkeeping methods for handling salvage material accounts is found among the various companies. The usual bookkeeping method, where materials can be reworked and made serviceable is to credit the department making the return of material to be renewed with 75 per cent of the current market cost of such material when new.

Materials which have gone through the salvage department and have been made serviceable are placed into the warehouse and "Stock Salvage" is credited with 100 per cent of the current market value of the goods. These goods, when requisitioned, are charged out at full value to the next job in the same manner as new material.

Some companies have especially prepared forms for use in carrying on their salvage work.

One company makes a record on a field transfer form of all equipment as it comes into the salvage department. The form gives the location of the lease from which the equipment was taken and the purpose for which it had been used. It is made out in the desired number of copies and the original sent to the general office accounting department.

A work card composed of two parts, which are detachable, is filled out with the necessary information for each piece of equipment. Both parts carry the same number. One-half of the card is fastened to the equipment, and the necessary information called for on the other half is filled in by the man who does the repair work.

The completely filled in card shows the date the equipment was received, the date that repairs were completed, by whom the repairs were made, the total hours spent on the job, materials used, and in some cases, a sketch of the equipment.

When the material has been reconditioned, it is placed in the field warehouse. The transfer of all material from the salvage department to the warehouse is covered by a form called "Salvage and repair department transfer."

Another and what seems to the author better system of overcoming the prejudice that certain workers have against using salvaged equipment has been adopted by one of the large Mid-Continent refining companies. This company has recently established a systematized salvage department. All salvage materials are plainly marked by a white cross painted on them and superintendents and foremen have been notified that no charge will be made against their jobs for any reclaimed material used. This insures the use of these materials which the salvage department of the company "stands behind" just as the manufacturer "stands behind" the goods when new.

*Printed by permission of the Director, U. S. Bureau of Mines.

**Supervising engineer, U. S. Bureau of Mines, Field Office, San Francisco.

The salvage department is usually located at some central point in the field or refinery and, if possible, near the main stores department. Many companies instruct their truck drivers and teamsters, when delivering new materials about the field to pick up discarded secondhand material and to deliver it to the salvage yard on their return trips. When the material arrives at the salvage yard it is carefully examined and segregated. Material which is badly worn or damaged beyond repair is thrown into a bin and later sold as junk at the prevailing market price. Material which can be repaired economically is listed and its value is credited to the job from which it has been returned.

Equipment for Salvage Department

The tendency of many companies has been to carry on their salvage work in an out-of-the-way corner of the machine shop or forge shop and with any tools that are at hand. This practice is not conducive to good work or for the best interests of the salvage department. The men engaged in salvage work are as valuable to a company as any of its other employes and they should not only be provided with the necessary tools to carry on the salvage work in a thorough and efficient manner, but should be properly housed as well.

Buildings in which salvage operations are carried on should be substantially constructed, well lighted, ventilated, and equipped with traveling hoists capable of handling materials up to 3000 pounds in weight. It is estimated that a building of reasonable size for handling miscellaneous materials to be salvaged, exclusive of large pipe and casing, can be built at a cost of from $10,000 to $15,000.

Assuming that the materials to be salvaged are gathered from the production, pipe line and refining departments and that the company carrying on salvage work is already provided with a machine shop, forge shop, and carpenter shop, equipment for the salvage department should include pipe straightening machines large enough to take the largest size of casing used on the various leases; necessary sizes of pipe cutters; suitable lathe, (unless ready access can be had to the lathes in the machine shop); a soaking bath for small fittings; a complete set of valve reseating tools for globe valves from ¼-inch up, and for gate valves from 1-inch to the largest size used; an acetylene or electric cutting and welding apparatus; wrenches in assorted sizes; brass mallets; machinists' hammers; cold chisels; wrenches for seating valve rings; ball grinding apparatus; emery wheels; grindstones; files; hack saws; emery paper and other small equipment such as is used by mechanics; a hydraulic hand pump for testing valves up to 2000 pounds pressure; pipe and chain tongs of desired sizes; small forge and anvil; stocks and dies for cutting threads on bolts and a set for pipe up to two inches in diameter; a sucker rod tensile testing machine; and for some companies, a small brass foundry and equipment.

Salvages in the Oil Fields

PERHAPS the most flagrant losses in materials have been in drilling and producing departments. In drilling new territory this may often be due to small companies engaged in wildcatting. These frequently operate on so small a margin of capital that the failure of the well or wells to obtain production results in the collapse of their entire enterprise, with the result that they must either abandon their equipment or accept whatever a reclaim dealer or a larger concern sees fit to offer them.

Well Casing

The necessity for having perfect threads and straight pipe in drilling has had a psychological effect on many drillers the result of which has been that they refuse to accept anything but new materials for drilling equipment. This is especially true when drilling in wildcat territory. This psychological effect is undoubtedly responsible for the prejudice which many drillers have against renewed material.

For example, a gang of roustabouts in cleaning up a derrick after the

Bins filled with discarded material sorted to be sold as junk

Tools and Equipment for the Salvage Department of an Oil Company:

Pipe straightening machines large enough to take the largest size of casing used.

Necessary sizes of pipe cutters.

Suitable lathe, unless ready access can be had to lathes in the machine shop.

Soaking bath for small fittings.

Complete set of valve reseating tools for globe valves from quarter-inch up and for gate valves from 1-inch to largest size used.

Acetylene or electric cutting and welding apparatus.

Wrenches in assorted sizes, brass mallets, machinists' hammers, cold chisels, wrenches for seating valve rings, ball grinding apparatus.

Emery wheels, grindstones, files, hack saws, emery paper and other small equipment such as is used by mechanics.

Hydraulic hand pump for testing valves up to 2000 pounds pressure.

Pipe and chain tongs of desired sizes.

Small forge and anvil.

Stocks and dies for cutting threads on bolts and a set for pipe up to 2 inches in diameter.

A sucker rod tensile testing machine.

For some companies a small brass foundry and equipment.

An ingenious, homemade apparatus used by an oil company for regrinding ball seats and valves

well had been brought in, found 37 reclaimed underreamer lugs hidden beneath the derrick floor. Although these lugs were in perfect condition, the drillers would not use them because they were not new.

Casing Salvages

Because the casing used in drilling an oil well represents the largest single item of material expense it presents the greatest opportunities for economy in salvaging. It is common practice, wherever possible in proven territory, to pull certain strings of casing when the well has been completed or abandoned.

Pulling casing to be reclaimed and resold has come to be a profitable business in many fields, especially in the Humble field of Texas. Drilling equipment when available, is used to pull the casing. In many instances contractors have devised their own equipment for pulling casing, and at least one concern is manufacturing a complete unit which may be used not only for pulling the casing but also for unscrewing the pipe. "Breaking joints" is often a difficult matter, especially if the pipe has been in the ground for a long time.

This unit is mounted on a truck and costs about $3500. It is claimed that with this unit, from 1000 to 1500 feet of pipe can be recovered in an 8-hour day. The pulling unit consists essentially of hydraulic pumps mounted on a truck. The pumps, which derive their power from the truck motor, operate heavy hydraulic jacks. The casing is gripped by a jaw between the two cylinders of the jacks. The jacks can lift the pipe 7 feet before it is necessary to reset them. Mud pumps are included in the equipment so that the hole can be filled with mud after the casing is pulled.

An oil derrick made almost entirely of reclaimed materials

Other portable equipment include a 30-foot derrick mounted on skids, a tractor for "breaking" tight joints and an automobile with equipment for shooting the casing to "break" it preparatory to pulling.

Many companies have an inspector examine the pipe carefully for defects in the threads and welds, crooked joints, splits and holes, after the casing has been pulled and piled on the casing rack at the derrick. All imperfect joints are sent to the pipe shops for repair and the good joints are transported to the next job.

Such inspection is usually not thorough enough to single out all imperfect joints. No casing that has been used in a well can be said to have been properly inspected unless the mill collar has been backed off and the threads thoroughly examined. If a string of casing has been dropped in a well or otherwise roughly handled, an injury may result to threads under the mill collar which may not be detected until the pipe is put into another well and parts at a crucial moment. When casing has been pulled it is far better to spend the money necessary to send it all to the shop for a thorough inspection than to

Discarded sheave wheel, cable and rig timbers used for changing the slops of a jack line

take chances in putting any of it into a new well improperly inspected.

Pipe Straightening Machines

When the casing, tubing or line pipe arrives at the salvage yard the straight joints are sorted out and put into piles to be cleaned and re-threaded where necessary. The crooked joints are sent to the pipe straightening machine. Such machines are of various types. They are for the most part homemade affairs built to accord with the ideas of the designer who is usually the man in charge of the reclamation division. Even the most elaborate of them are relatively inexpensive to construct; nevertheless, effective work can be done with them.

After pipe has been straightened and reconditioned it should be thoroughly inspected for splits, holes, and thin spots. Probably most of it will be in a condition such that it can be used as the equivalent of new pipe. Those joints or portions of joints that are not "as good as new" can nevertheless serve many useful purposes. Example of what is being done toward using salvaged pipe by many of the larger operators throughout the United States is described on the following pages.

Uses for Reclaimed Pipe

Derricks Made from Water Pipe

Many derricks used at pumping wells in some of the Pennsylvanian fields are of the portable type. They are usually made from discarded 2 and 3-inch pipe formerly used for water service. The sway braces and girts are made out of the weaker joints of pipe by cutting them into suitable lengths and flattening the ends. The full lengths of the better grades of recovered pipe are used for the legs of the derricks.

Some of the pipe and tubing used in the derricks in Pennsylvania is said to have been made 35 years ago and in some instances has served for water lines or in wells as long as 20 years before being put in its present use. Nearly all of it is lapwelded. As a protection against rust the derricks are painted from time to time with heavy crude oil or with still bottom residuals.

Samson Post

A type of Samson post used in a Texas field is made from 16-inch discarded casing. A plate is welded to the bottom of the post so that it can be securely bolted to the rig timber upon which it rests. The top is fitted with the necessary rig irons to support the walking beam. The post is guyed at four points. The guys are made from discarded sucker rods cut to the desired length, threaded and fitted with turnbuckles.

Supports for Water Tanks

Very useful supports for water tanks can be made by welding together 2-inch and 4-inch pipe. These supports have the advantage over other water tank supports, especially wooden ones in that they are strong, relatively light and easily portable.

Supports for Steam Pipes

Steam pipe standards can also be made from discarded 2-inch or 3-inch pipe. These standards are light, strong, easily portable and can be quickly erected. They also lend themselves admirably toward taking care of the expansion and contraction of the steam line, as they are free to move in a direction parallel to the axis of the pipe.

Unloading Derrick

Unloading derricks can be made from discarded 6-inch pipe. Such a derrick is useful in changing or mounting crude oil and gasoline tanks on automobile truck chassis or for loading or unloading heavy loads from trucks and wagons.

Derrick Stoves

Derrick stoves can be made from discarded 12-inch casing, and discarded boiler plate, and strap iron. These stoves were welded in the shop at slack times between routine jobs. The stoves have proved effective not only for derrick use but for use in bunk houses, warehouses and shops.

Oil Cans

Oil cans can also be made at odd times from material which otherwise would be discarded or sold for junk. These are made with a welding apparatus from discarded sheet iron. The spouts of the cans are discarded pipe collars. Pipe plugs are used for stoppers.

Pumping Jack

Pumping jacks can be made almost entirely from discarded pipe. A large number of such jacks are used by a Mid-Continent oil company. They have been found to be highly satisfactory as they are relatively light in weight, unusually durable and easily transported from place to place.

Bull Wheels

Bull wheels axles are made from discarded well casing. Flanges cut from discarded boiler plates are welded to the axle. The spokes of the wheels are bolted to the flanges. A piece of shafting about one foot long is welded by means of a spider, into either end of the pipe axle. The shafting then becomes that part of the axle which rests in the bearing boxes when the bull wheels are in place in the derrick.

Pup-Joints

"Pup-joints" (short lengths) can be made from various sizes of discarded pipe and casing, most of which has been in the ground for a long time. The pipe or casing should first be carefully inspected and the best portions marked by the inspector. These are cut off and threaded. The remainder of the pipe, where not too badly corroded, can be split with a cutting torch and flattened out to be worked up later into useful equipment for which steel plates are required.

Nipples

Other uses for small sizes of pipe, part of the joints of which have been split by freezing or damaged otherwise, are to cut the good parts up into nipples of various lengths. Many

Mid-Continent companies seldom purchase any nipples in sizes of ½-inch to 4 inches. Nipples of this size are cut at odd times by the salvage department from discarded pipe.

Reclaimed pipe of small diameter, together with discarded strap iron, can also be utilized for the construction of gates, ladders, platforms, railings, and various kinds of safety devices.

Overhead Guards for Jack Lines

Extensive use is being made in some fields of discarded pipe for overhead guards for jack lines. Jack lines suspended across roads and highways are a source of danger to trucks and cars which must pass under them. Frequently jack lines part and allow that section which spans a thoroughfare to sag, creating a hazard that might lead to a serious accident. Such a hazard is especially serious at night because it is difficult to see a black wire line even when an approaching automobile is traveling at a moderate rate of speed.

Overhead guards for jack lines are usually posts of 4-inch or 4½-inch discarded pipe of desired lengths set on either side of the roadway in concrete blocks. To the tops of the posts, a piece of 8-inch or 10-inch discarded casing split lengthwise is bolted or welded with the concave side up like the letter U. This cross piece forms a trough into which the jack line will fall if it breaks, thus preventing the moving line from sagging down over the road and creating a hazard. The entire guard is usually painted white to increase visibility.

Sucker Rods

Home made machines for testing reclaimed sucker rods are now being constructed by many companies. Such a machine consists of a concrete pier about 35 feet long, on one end of which is mounted a wheel about 6 feet in diameter which is welded together from discarded 1-inch pipe. A series of lever arms on the opposite end of the concrete pier register, by means of a set of portable platform scales, tests the tensile strain put on the sucker rod.

The hub of the wheel is drilled and tapped to engage a temper screw. The sucker rod to be tested is fastened between the end of the inboard lever arm and the temper screw. Tensile stress is put into the sucker rod by turning the hand wheel. The amount of stress is measured on the platform scales.

When reclaiming sucker rods, the most likely looking ones are selected from those brought in from the fields. These are straightened when necessary and then placed in the testing machine. If the rods successfully withstand the tensile test, the boxes and pins are examined carefully. If defective boxes are found they are cut off and new ones welded on. The rods are then given another test before being returned to the field. Subs are used on the second test so as to test the threads as well as the rods themselves.

Sucker rods that are not suitable to be reused in pumping wells are cut up for sway braces for derricks; for use as reinforcing for concrete, or for any of the purposes for which round bars of this description can be utilized.

An accompanying photograph shows a derrick, the guy wires and sway braces of which are made from reclaimed sucker rods. The legs of the derrick are made from reclaimed pipe and the girts, top, sheave wheel supports, and guard rails from reclaimed lumber.

Ball Grinding Apparatus

An ingenious homemade apparatus for grinding the ball valves and seats of oil well plunger pumps is also illustrated with this article. The apparatus consists essentially of a small electric motor connected directly to a shaft. This shaft terminates in a removable steel socket. The socket is turned out in a lathe from tool steel and ground to the radius required for the particular diameter of ball in question, hence there is a socket for each standard size of ball.

A manually operated chuck holds the valve seat. When a ball is to be ground the seat is fitted into the chuck and the ball, after being smeared with emery paste, is placed upon it. The ball is then held against the rapidly revolving socket and ground until perfect contact is obtained with the seat at all parts of its surface.

Balls from 1¾ inches to 2¾ inches in diameter can be ground in the apparatus shown. The cost of constructing this ball and seat grinding apparatus was about $250, which includes the cost of a 3 horsepower motor. This size motor is larger than required but was used because a smaller size motor was not available. Balls and seats often come into the shop in very bad condition, due to the corrosive effect of alkaline waters. Nevertheless an average of 12 balls and seats in bad condition can be ground in 10 hours.

Boiler Tubes and Shells

A Wyoming company is using a rattler for reclaiming boiler tubes. It is made from a discarded boiler shell mounted on discarded pulley wheels. A gas engine, chain connected to a sprocket at one end of the rattler, furnishes the power for rotation. A charge of boiler tubes consists of a little less than 50 per cent of the capacity of the rattler.

When the rattler is loaded with tubes it is revolved slowly until all the boiler scale is knocked off. The tubes are then taken into the blacksmith shop and inspected for splits and other defects. The tubes that are sound are cut off at both ends far enough back to insure a true

Oil Well Pumping

The pumping of oil wells is not a closed subject on which everything has been learned. New deeper wells, large volumes of salt water and crooked holes, bring new problems. Engineers of our industry also are learning how to lift oil more economically from old shallow sands.

National Petroleum News has presented to its readers a large number of articles describing advances in the science of oil well pumping.

For your file reference we list 30 oil well pumping articles that have been published in National Petroleum News since 1928:

1930

Advantages of central power pumping discussed — Feb. 12, p. 43

1929

Pumping deep crooked wells discussed — Aug. 21, p. 38

Valve travel problems in deep well pumping — Aug. 14, p. 59

Field foreman tells of economical operation of small wells — July 31, p. 60

Deep well pumping confronts Tonkawa producers — June 26, p. 40

Economics of pipe line pumping — Feb. 6, p. 54

1928

Pump cutting agent breaks emulsion — Dec. 12, p. 58

Rod troubles in deep pumping solved by combination pump and flowing device — Nov. 7, p. 37

Automatic oil well pump for small wells — Oct. 17, p. 52

Centrifugal "time" clutch pumps deep California wells — Oct. 10, p. 60

Pumping problems facing Winkler operators — Sept. 12, p. 42

Special well hook-ups designed for Winkler — Sept. 12, p. 44

Portable emergency pumps for pipe line service — Sept. 12, p. 54

Multiple pumping of oil wells — Aug. 22, p. 51; Aug. 1, p. 47

How power pumping cuts costs on Kansas lease — July 11, p. 99

Selection of power equipment for oil well pumping — June 27, p. 81; June 6, p. 91; May 23, p. 49; Apr. 25, p. 69; Apr. 18, p. 24

Co-operative pumping of deep wells in Cromwell — June 12, p. 60

Fluid displacement pump used with gas lift — Apr. 25, p. 100

Application of power on oil well plunger pumps — March 21, p. 63; March 7, p. 67

Review of developments in plunger pumping equipment — Jan. 4, p. 55; Dec. 7, 1927, p. 93; Nov. 30, 1927, p. 53; Nov. 9, 1927, p. 65; Oct. 26, 1927, p. 67.

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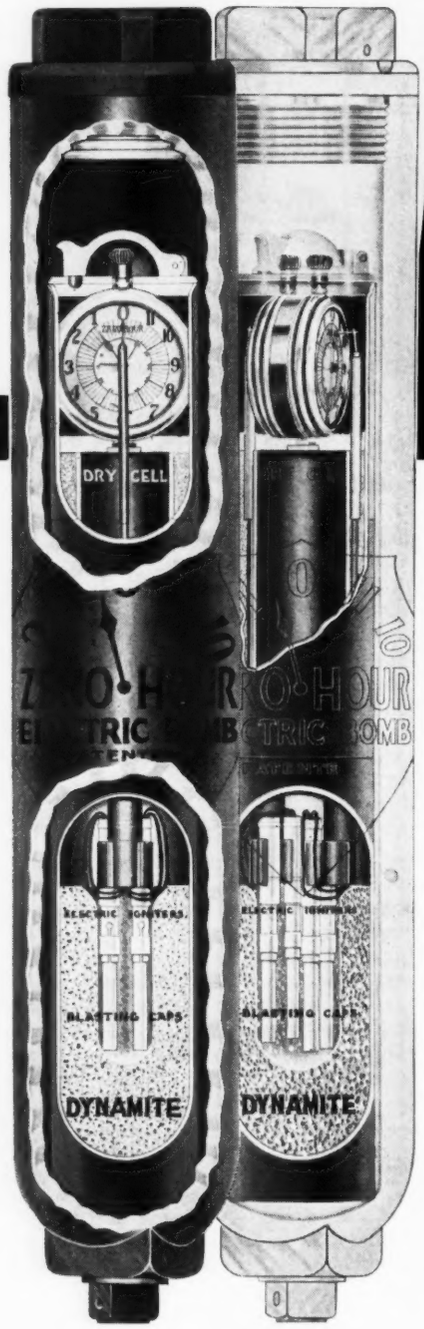

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Plug and Socket Connectors ..... Improved Firing Pin

What has been your hardest shooting problem?

Many experienced operators have come to consider Zero Hour Electric Bombs as almost indispensable for putting off sand-tamped shots; shots where a liner is pulled, after the charge is placed; shots where the pipe is pulled, almost invariably burying the charge; shots where fluid is swabbed down, pulling in cavings over the charge; putting off the shot in a deep, crooked hole; in trouble shots to sidetrack tools and in shots to salvage casing in deep holes containing heavy fluid. These operators recognize in the Zero Hour Duplex Electric Bomb a degree of perfection which makes it the *super-utility means* for putting off any and every kind of shot. In every way that a time-controlled, electrically operated detonating device excels an obsolete method, the Zero Hour Duplex Electric Bomb carries that excellence to the super degree.

The Duplex is not a "double" bomb. It is enclosed in the same size container that formerly held the original Zero Hour Bomb. But all of its vital working parts have been duplicated, hence the Duplex principle. There are two watches and two sets of blasting caps where one was contained before. In this manner there are two complete timing and firing mechanisms, each independent of the other, enclosed in the same metal, fluid-tight container that formerly held one only. By this addition the chance of a failure with the Duplex Bomb has been reduced to a figure so small that it is almost beyond computation in ordinary mathematics. The only additional operations in setting are the winding and setting of a second watch, identical with the first one, followed by the attachment of the additional igniter and blasting caps. This attachment has been simplified by a plug and socket connection, assuring perfect electrical connections by merely pushing in a plug. The gold spring firing pin holds accurately to the "O" firing point, no matter how often the hour hand passes either forward or backward across it, in testing. Because the Zero Hour Duplex Electric Bomb puts off *any* shot so positively, safely and economically, it is the perfect and preferred means for *all* of them.

Zero Hour Electric Bomb

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Zero Hour Bombs are obtainable through all principal torpedo companies

circle in cross section. A section of new tube is then welded on to one end of the reclaimed tube. The repaired tube is then cut off to the desired length and the welded end annealed.

Discarded boiler shells may also be used for low pressure vessels, gas traps, incinerators, and blow-off pits for boilers. Discarded boiler tubes from all types of boilers may be utilized for fence posts, cattle guards and for various other purposes.

Drilling Bits

Discarded cable tool drilling bits are worth comparatively little as junk. However, it is seldom that any of the larger oil companies sell them for junk. This is especially true of bits of the larger sizes.

It is estimated that a 15-inch bit can be reworked into an extra long 10-inch bit, worth $144, at a cost of $28. This cost includes all overhead charges, interests, depreciation, and taxes on equipment. Such a bit weighs about 1200 pounds and would seldom bring over $1.75 if sold as junk. Recapping 12-inch bits costs approximately $35 and makes the bit as good as new. A new bit of this size is worth about $168. Most of the other sizes of bits can be reworked at corresponding savings.

Underreamer Lugs

Relatively large savings can be effected by repairing underreamer lugs. When not too badly worn, these can be built up by welding manganese steel rods on the edges and then reshaping and tempering. A set of lugs costing $65 originally can usually be repaired and put into first class condition at a cost not to exceed $2.50 to $5.

Cable and Wire Line Salvages

Attempts to use partly worn out drilling and sand lines have not proven very satisfactory. Worn out sand lines have sometimes been used for guying derricks, but it is questionable whether this is good practice. At times of high winds, when an unusually heavy strain comes on the guy line, reclaimed sand line guys may part and permit the derrick to fall over. In some fields worn out drilling cables have been used satisfactorily for jack lines. Old drilling lines are also used as suspension cables for pipe lines where they cross water courses or ravines.

An accompanying illustration shows a discarded drilling line now used as a jack line, and a discarded sheave wheel used in place of a rocker to carry the line over the brow of a hill. The sheave wheel is mounted on discarded rig timbers. In California, discarded wire lines are sometimes used in logging operations and in sand pits and gravel quarries.

If the cables are not too badly worn they may serve in these capacities for a considerable length of time, but the author was unable to find any operators who had used them for these purposes who recommended such procedure. In some places cables and drilling lines are used for fences but here again they have not been found very satisfactory because of their weight. This is especially true of wire lines of the larger sizes.

Wire lines are hard to stretch and, if the ends are not securely anchored, it is only a matter of time until the posts supporting them are drawn out of plumb. Entire fences are made ragged and unattractive when the fence posts loosen or tilt. In some states highway departments are experimenting with old cables for guard fences along the highways, but the author has no data regarding the outcome of the experiments. Tangled masses of rusty cable in varying stages of decomposition fill dry washes about many of the oil fields mainly because no very satisfactory use has been found so far for discarded wire lines.

Worn out manila rope has a sale value in some cases. Buyers of second hand manila cordage cut it up into short lengths for use in the manufacture of roofing paper and as a binder for plaster. Many oil companies also chop up used manila rope to help "mud up" foundations when drilling through loose and cavy ground.

Brass Foundry

Some of the larger oil companies have found it economical to operate a small brass foundry at their central field shops.

Copper wire, brass lathe cuttings and chips, discarded valve stems and trimmings, and other discarded copper and brass are brought in from the fields and melted down. For certain jobs, other metals are added to make pig brass or castings of certain metal composition. Natural gas is usually used to melt the charge in the furnace.

Small brass foundries have been found decidedly advantageous, especially in districts remote from manufacturing centers where the delay occasioned by having to get machine parts from the factory is sometimes costly. The pattern maker who is usually the brass foundryman, is generally also a machinist so that, when he is not busy in the foundry, he can be employed in the machine shop. In that way he can be kept busy on other work when work in the foundry is slack.

Draw Works Sprocket Chains

Many companies have a department in their salvage yards devoted to the reclamation of sprocket chains. The oil and dirt covered chains from the field are first spread out on a table and carefully inspected. All link-bars, rollers and pins requiring replacement are marked by an inspector. A chain-repair man then disassembles the chain and makes the necessary replacement.

Draw Works Clutches

A skillful oxyacetylene or electric welder can rebuild the square corners in the clutches of the draw works which have become rounded from use. Such work can be done at a small cost and rebuilt clutches usually give good service.

Oil and Water Tanks

One of the large Mid-Continent companies operating in a district where water for drilling purposes as well as water produced with the oil is highly corrosive, finds it economical to repair rather than discard its field water and run down tanks when they are corroded through in spots.

Field tanks in need of repair are taken to the material concentration yard on a specially constructed trailer which is hitched to an ordinary field truck. If the tanks are of bolted construction, they are disassembled. Where necessary new bolts and new plates are provided and new gaskets installed. If the tanks are of the riveted type, corroded plates and rivets are cut out, replaced with new ones and the tanks reloaded on the trucks and sent back to the fields.

This company also reworks its wood stave tanks and these, where not too large, are taken to the concentration yards in a similar manner where the necessary repairs are made.

Tank bottom sheets that have been replaced on account of corrosion can often be used in the construction of small tanks up to 1000 barrels capacity or even larger, hotwells, incinerators, and for other purposes.

Salvages in Pipe Line Systems

BY THE very nature of the operations, salvages in pipe lines and pumping systems do not admit of the possibilities of money saving as in the producing division of the oil industry. The pumps are in constant need of repair. Their cylinders must be relined and rebored from time to time, new pistons put in and the valves replaced, but the other parts of the pumps, barring accidents, will usually remain intact indefinitely.

Trunk pipe lines, unless the oil fields that they serve become depleted, are usually left in the ground until they fail by corrosion—usually from without—and are then probably fit only for culvert pipes.

Pipe lines in some parts of the Mid-Continent district and in California, however, corrode rapidly. It is common practice in these areas to cover the pipes with roofing paper before they are laid, in order to pre-

Spiral wrap method of covering pipe, which is replacing the method in which the paper is applied in sheets. The pipe shown in the photograph is 8-inch, and the paper 12 inches and 3 inches in width

vent corrosive waters from reaching the pipes.

Throughout various parts of Texas and in the San Joaquin Valley of California hundreds of miles of pipe lines, where they pass through strongly alkaline soils have been dug up, cleaned, wrapped with roofing paper, returned to the ditch and the ditches back-filled without interrupting the flow of oil.

Formerly the paper was applied to the pipe in sheets, cut in lengths to fit between the collars. The paper was folded around the pipe longitudinally after the joint had been cleaned and painted with asphalt. The lap was then pasted down with hot asphalt and wires placed around the paper at intervals of about 3 feet to make sure that it would not pull away from the pipe before the asphalt had time to set.

It is the author's belief, however, that a perfect bond between the pipe and the paper can seldom be made by this method because it is practically impossible to draw so large a piece of paper tight around the pipe. After the pipe is lowered into the ditch a wrinkle will develop in the paper which often extends the full length of the joint. Corrosive water will soon work into this wrinkle and may reach all parts of the joint where there is not a perfect bond between the pipe and the paper.

A more satisfactory method of applying roofing paper to a pipe line is what is called the "spiral wrap" method. The roofing paper is cut into the desired widths in the mill and shipped in rolls, each containing a strip about 30 feet in length. For convenience in transportation these rolls are usually put into a bundle making a package about 36 inches long. This package is covered with wrapping paper, so that it presents much the same appearance when delivered on the job as an ordinary roll of roofing paper.

The width of paper to be used depends, of course, on the size of the pipe which is to be covered. The pipe shown is 8 inches in diameter and the paper 12 inches and 3 inches in width.

The pipe to be covered is first thoroughly cleaned. It is then given a coat of refined asphalt or some similar protective preparation. The 12-inch strip of paper is then wrapped spirally around the pipe before the asphalt or paint has had time to set. The paper wraps are given a pitch such that there is a space or crack about ½-inch wide running spirally around the pipe between the edges of the paper.

This crack is then painted with asphalt and the 3-inch strip is wrapped over it. A sufficient number of wrappings of 3-inch paper are put around the pipe on either side of the collar to build up shoulders equal in diameter to the outer diameter of the collar. These 3-inch shoulders, together with the collar, are then given a coating of asphalt and covered with a layer of paper.

In the author's opinion this makes the best possible job to be had with a roofing paper type of covering. The paper sticks securely to the pipe at all points and there is little or no possibility of a wrinkle forming in the paper after the pipe is lowered into the ditch. The author has recently examined some 8-inch pipe covered in this manner under his direction in 1909 and found the contact between the pipe and the paper to be still in practically perfect condition.

Salvages About Refining Plants

PROBABLY the largest single item of material salvaged about refineries is valves and fittings.

Discarded valves and fittings of various sizes are gathered from time to time by the trucks which deliver materials about the refinery or fields and are brought by them to the salvage department.

In repairing valves and fittings, the first operation is to back out the nipples and "break" the pipe connections. Generally the valves and fittings are covered with oil and dirt and the most satisfactory procedure is to first clean off all foreign materials by immersing them in some sort of a cleaning bath.

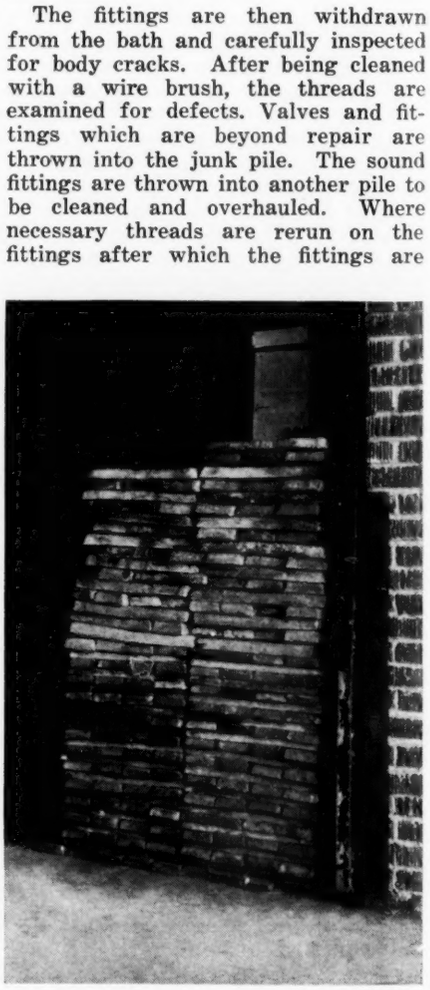
Some operators use distillate, but a hot lye solution will usually do better work. The lye solution is made by adding concentrated lye in the proportion of about one half pound to the gallon of water and heating the fluid to a temperature of from 180° to 212° F.

Because a lye solution is injurious to the hands of the workman many of the larger operators are using special compounds marketed by various oil and chemical companies. Some of these compounds are especially effective in removing oil and dirt from valves and fittings and at the same time do not injure the skin.

Vats for Soaking Valves and Fittings

Various types of vats are used in cleaning valves and fittings. Usually these are about 3 feet deep, 2 to 4 feet wide and 4 to 10 feet long. Most large size vats are equipped with some type of heating apparatus, usually steam coils. They are also equipped with small chain blocks attached to a crane. The fittings to be cleaned are placed in a metal cage and lowered into the vat. The time of immersion varies from 20 minutes to an hour depending upon the condition of the materials to be cleaned.

The fittings are then withdrawn from the bath and carefully inspected for body cracks. After being cleaned with a wire brush, the threads are examined for defects. Valves and fittings which are beyond repair are thrown into the junk pile. The sound fittings are thrown into another pile to be cleaned and overhauled. Where necessary threads are rerun on the fittings after which the fittings are



Pig lead reclaimed at the refinery from the lining of discarded agitators, acid lines and so on

burnished on a buffer. The threads are then oiled and the fittings put back into stock. Some companies paint the fittings to make them look like new.

All valves are taken apart, examined for defects and defective parts that cannot be repaired are replaced. The valves and seats of small valves are reground by hand. The valves are then reassembled, cleaned and buffed.

Large Size Valves

The large size valves which are practically all gate valves are disassembled, inspected and defective parts replaced. The faces of the valves and seats are then reground. Various devices have been built for doing this work. In regrinding, the stripped valve is placed on a bench and a grinding disc smeared with emery paste is inserted in the valve above the face which is to be ground. The disc is then revolved against the face to be ground by a flexible shaft.

When grinding the seat of a globe valve, the flexible shaft of the valve grinding machine is attached directly to the valve stem and the valve ground into the seat.

The large sizes of gate valves are usually handled by chain hoists and cranes. The grinding apparatus used for grinding the seats of large gate valves differs somewhat from that used for smaller valves. The flexible shaft is portable and terminates in a square bar of steel. In the grinding operation, the grinding disc is smeared with emery paste and placed against the valve face to be ground. The square bar of steel on the end of the flexible shaft is placed in a recess which extends about half way through the center of the grinding disc. The size of the recess in the disc is slightly larger than the size of the square bar on the end of the shaft. The resulting loose fit acts similar to a universal joint. Without it, the operator would have difficulty in holding the disc flat against the face which he is grinding.

All reclaimed valves should be carefully tested before being put back into stock.

Reclaiming Lead

Many refineries reclaim the lead lining from discarded agitators and acid lines by melting the lead in lead kettles. The scum that rises to the surface of the molten mass is carefully removed and the lead is poured into molds. The pig lead is used in the making of babbitt metal and for various other purposes around the plants. An accompanying illustration shows a pile of reclaimed pig lead in the storeroom of a Mid-Continent refinery.

Tanks for Sweetening Gasoline

Some of the Mid-Continent refineries are using discarded tanks from railroad tank cars for continuous treating equipment for the sweetening of gasoline. The domes of the tanks and other appendages are removed and the openings closed by welding plates over them. The tanks are then up-ended, placed in the desired location, and the necessary connections made to the sweetening system by means of the welding torch. These have proven very satisfactory for this work.

Oil Drums

Discarded oil drums and other such containers may often be utilized for rag receptacles or incinerators. Depositing oily rags and waste in discarded oil drum receptacles is a means of eliminating fire hazard.

Many companies apparently do not keep their books in such a manner that net earnings of their salvage departments are shown. However, wherever the author has discussed the subject with oil operators he has found the consensus of opinion to be that their salvage departments are profitable enterprises.

The results of the study of salvage operations in the petroleum industry lead the author to the conclusion that organized and efficiently operated salvage departments pay large dividends to an oil company, regardless of its size or scope of operations.

New Equipment

The Griscom-Russell Co., 285 Madison Ave., New York, has designed what it calls the G-R Equaflo exchanger in shell stills for refineries, the distinctive feature of which is the use of tubes swaged down at one end to permit closer spacing of the tubes in the shell and retain sufficient bridge wall in the tube sheets for strength. Cross baffles in the shells are eliminated, the company says, and tubes are so placed that the area of flow through the shell may be equal to the area of flow through the tubes.

A. W. Wheaton Brass Works, Newark, N. J., is now making its type 50 auto filling nozzle with a disc holder which tightly encases the disc, thus sheathing it from saturation and protecting it from disintegration resulting in longer life.

* * *

The Autocar Co., Ardmore, Pa., truck manufacturer, has placed E. D. Sirrine on the staff as transportation engineer, according to H. M. Coale, vice president in charge of sales.

The Superheater Co., 17 E. 42nd St., New York, has elected Frederick Alan Schaff president, succeeding George L. Bourne, who becomes chairman of the board of directors. Mr. Schaff has been with the company since 1913, starting in its service department.

* * *

The Austin Co., Cleveland. O., designers and builders, has appointed Ralph Leavenworth as assistant general sales manager, according to George A. Bryant, Jr., executive vice president and general sales manager. Mr. Leavenworth was formerly with Paul Teas, Inc., advertising agency of Cleveland.

* * *

The Hays Corp., Michigan City, Indiana, announces a New Improved Hays Gas analyzer of the Orsat type. The apparatus weighs eight pounds including carrying case. Moulded glass absorption pipettes are used, with moulded rubber chemical bottles, steel wool surface absorption, monel metal needle valves and nickel removable valve seats replacing pinch clamps and glass stopcocks. A complete analysis of CO_2, O_2, and CO may be made in four to five minutes, it is claimed with the new apparatus.

* * *

Link-Belt Co., 910 S. Michigan Ave., Chicago, has placed on the market a hyper chain, which it terms a new and stronger drive chain for drilling rigs, meeting the standards of the American Petroleum Institute. The chain is made entirely from alloy steels and into it is incorporated maximum strength together with maximum durability, the company says.

Extraordinary care has been given to heat treatment of the parts. The internal grinding of the hole is a novel feature in chain construction, the company claims. The side bars are made from alloy bar stock, with holes which receive the pins and bushings conditioned by a new process in chain manufacture, providing holes which are accurate and densified by burnishing operations.

* * *

A recording pyrometer which is claimed by its maker to have the greatest width of chart of any on the market is one recently developed by Wilson-Maeulen Co., Inc., 383 Concord Ave., New York, which it calls its model 8201 potentiometer recording pyrometer.

This new apparatus has been developed to meet the demand for a pyrometer which has a wider record chart with more open record scale. It operates on the potentiometric principle, but with mechanical simplicity unusual for this type of instrument, the company says.

A bulletin describes and illustrates this instrument. It will be in production around Dec. 1.

SAFETY

Fig. 1—Leach High Pressure Vapor Heat Exchanger. Notice that the high pressure joint is entirely separate from low pressure joint and in no way dependent upon it.

HEAT Exchangers to be used at pressures of 1500 lbs. per sq. in. and temperatures of 750 deg. Fahr., as is necessary for the maximum profit from a cracking plant, must be proven safe against any possibility of leakage. The usual heat exchanger design, with the parts merely multiplied in thickness, is not suitable for extreme pressures. Special design is necessary. Fig. 1 shows the Leach High Pressure Vapor Heat Exchanger. Exchangers of this type have been in service for periods up to three years with oil pressures of 1500 lbs. per sq. in. and temperatures up to 750 deg. Fahr. Many units have been in continuous use for a year and more without requiring opening for inspection, cleaning or repair.

The features which make for safety can best be understood by comparison with more conventional design. The conventional design has a flat tube sheet. Fig. 2-B. This tube sheet, weakened by tube perforations, will flex throwing an indeterminate load on the stay bolts. It has been a rather general experience with flat tube sheets to find that the stay bolts were stressed beyond the elastic limit and required continual tightening to compensate for the gradual creep of the metal. Furthermore, if one stay bolt breaks the entire load carried by that bolt is imposed upon the adjacent stay bolts. This introduces an element of danger as with even the most careful selection of metal and the best inspection, it is too much to expect every bolt to be perfect.

Leach Tube Sheet Stiffened by Flanges and Ribs:

In the Leach design, Fig. 2-A, the tube sheet is an integral part of a flanged base casting. It is stiffened on both sides by deep flanges and by ribs. As a result, each stay bolt carries only its allotted share of the load. If a stay bolt breaks, the resultant overload is distributed equally among all the remaining stay bolts and among *all the peripheral bolts.* This was proven recently by removing four adjacent stay bolts from the center of a 1100 sq. ft. Leach Exchanger under a test pressure of 3000 lbs. per sq. in. There was no leakage even through the holes of the stay bolts which had been removed.

The Leach design is so much stiffer than the usual design that a 3 inch tube sheet gives the same factor of safety as a 12 in. tube sheet in the usual type.

Relation of Design to Gasket Failure:

A second advantage of the Leach channel casting design is the absence of through bolts connecting more than two pieces. When pressure is applied to a gasketed joint, there is a certain elastic stretch of the bolts. Elastic gaskets are employed in the joint to compensate for this stretch. In the Leach Exchanger, shown in Fig. 2-A the longest high pressure bolt is a 1⅝ in. bolt 14¾ in. long, and the maximum stress applied is 14,000 lbs. per sq. in. With a Youngs modulus of 28,000,000#/in.^{2}, the maximum separation of the flanges for which the gasket must compensate is .006 inches.

In the separate tube sheet design, the thickness of the tube sheet and the presence of three flanges makes a 26 in. bolt necessary. Employing 2¼ in. bolts and spacing them as close as possible, gives a maximum stress of 20,000 lbs/in.^{2}. With this stress and length the separation of the flanges is .017 in.

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Modern Refining — Science and Practice

By Colonel George A Burrell*

Article 14

Gum, Color, Odor and Flourescence of Cracked Gasoline

IT IS not definitely known what causes gum deposition, "off color," and bad odor in some gasolines. Color may develop due to air oxidation of refined cracked gasolines that stands for some time, in some refined or unrefined straight run gasoline, in the absence of steam stilling after acid treating, and sometimes when too much sulfur is added in the plumbite treatment.

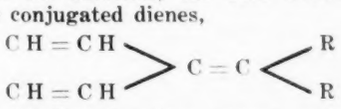
Low temperature steam distillation after acid treatment will keep most distillates from going off color. Too high a temperature causes the decomposition of alkyl sulfuric acids and other compounds which remain in the oil after acid treatment. Some of these products are colored.

Gum makes its appearance in quantity in gasolines made by high temperature cracking. Gum is reddish or light reddish brown and solid or semi-solid. Too much of it in gasoline causes motor intake valves to stick, and guides to clog with a black brittle material. There is not necessarily any connection between gum and color for water white gasolines may show much gum and yellow ones but little.

Color

Dunstan[1] states that coloring matter may be present in oil, colloidally dispersed, or as molecularly dissolved color. We know that color develops when some cracked gasolines are exposed to light. However, light is not always necessary for color development, although it accelerates it.

It has been suggested by Brooks[2] and Parker that the bright yellow color of freshly distilled highly cracked gasoline may be due to diolefins, in that the fulvenes, the best known of the conjugated dienes,



are shades of yellow, orange and red. Fulvene itself is a yellow oil. Coloring matter in fresh pressure distillate is not due to the simple olefins because they are not colored and on treatment with sulfuric acid do not give tarry products or color.

Brooks also stated that the prime cause of discoloration of petroleum distillates is due to the oxidation of sulfur compounds, as of mercaptans to sulfonic acid. Also any trace of sulfur dioxide left in the oil or introduced by decomposition when rerunning acid treated products oxidizes to sulfuric acid with resulting discoloration. Peroxides form and constitute a powerful oxidizing agent, according to Brooks, in the presence of sulfur dioxide, which they oxidize to sulfuric acid, bringing about later discoloration of the gasoline, and tar deposition therein, thus causing the resins or gum deposits we are familiar with. Oxidation of mercaptans may also cause discoloration.

Tauz[3] believes that the chief cause of coloring matter and sediment formation in gasolines is unsaturated hydrocarbons of a cyclic character to which also belong unsaturated five ring hydrocarbons, and that the oxidation of olefins does not cause coloring but only in combination with amines.

Washburn[4], working under the auspices of the American Petroleum Institute, found that the brown substance found on the inside of service bowls of gasoline service stations is a gum of unknown composition. Many gasoline samples were examined. Some of them faintly yellow at the start were not affected by carbon dioxide but when opened to the air gradually developed a blue fluorescence in reflected light. On standing a brown precipitate finally developed. The reaction, apparently an oxidation one, is catalyzed by light, especially ultraviolet light.

Upon analysis of the brown substance traces of copper were revealed, probably present due to the action of corrosive substances on brass or other copper containing metals or perhaps present because it was originally contained in the crude oil.

Carpenter[5] has stated "that the property of color reversion is due to unstable resin-forming bodies, and some of these are members of the five ring cyclo pentadiene family, including indene, coumerene, fulvenes, fluorene and their homologues and condensation products and there is a marked tendency towards the formation of peroxides of members of these classes, rather than of ordinary acid formation on oxidation. This confirms Brooks' earlier observations, who noted that cyclo pentadiene, indene, fulvenes, etc., are notorious for rapid auto oxidation, that the resinous oxidation products formed, via peroxides, are pale yellow if pure, and that in the presence of a trace of mercaptan or alkyl disulfide invariably present, the oxidation is accompanied by strong discoloration.

Carpenter adds: "Color reversion is present in all fractions of intentionally cracked hydrocarbons, but in straight carefully distilled kerosenes begins at about the 180-190 C. fraction. Immediately above 290 C. the property of reversion is very marked in untreated distillates and is due mainly to the presence of a large number of unstable substances boiling around and about 300 C. and over, some of which have been identified as related to bodies mentioned above.

"Two types of color reversion exist, namely:

"(a) In the dark. This is a polymerization or condensation of existing products, not necessarily accompanied by further oxidation, and affects a small portion of the kerosene only. The effect is easily removed by refining methods. The colored bodies can be bleached in sunlight, but are

[1]Royal Soc. Arts. Jan., 1928. p.51.
[2]Petroleum, July, 1924, p.42.

*Consulting Chemical Engineer, Pittsburgh, Pa.

[3]Z. Angew. Chem., 39, 685, 1926.
[4]From a fund donated by John D. Rockefeller and the Universal Oil Products Co.

[5]Jour. Inst. Pet. Tech. Oct., 1926, p.518.

Table I

Summary of Gum Tests on Engine (Vorhees and Eisinger)

Run No.	Fuel Used	Gum by Steam Oven Test MG/ 100 cc.	Gum by Oxygen Gum Test MG/ 25 cc.	Gum by Copper Dish Test MG/ 100 cc.	Weight of Deposit in Inlet Passage Grs.	Weight of Carbon Deposit on cyl. Head Grs.	R.P.M.	Lead H.P.	Length of Test Hours	Remarks
1	Commercial Gasoline No. 1..	4	3	10	0.00	....	1260	0.45	16¼	No gum deposit in inlet passage or in cylinder
2	Vapor phase Gasoline No. 2..	7	6	65	0.00	....	1370	0.45	16¾	No gum deposit in inlet passage or in cylinder
3	Vapor phase Gasoline (one year old) No. 3.....	120	520	665	3.99	3.29	1240	0.75	17¼	See photograph of cyl. head valve after test; valve sticking
4	Vapor phase Gasoline No. 4..	22	380	188	0.94	1.57	1230	0.80	21¼	Some gum deposit inside of cyl. head.
5	Vapor phase Gasoline No. 5..	17	360	237	0.41	3.38	1220	0.83	23¾	Some gum deposit inside of cyl. head
6	Fuel No. 6 (50% of Fuel No. 4 and 50% Fuel No. L).....	11	....	110	0.17	1.93	1240	0.85	19	Slight trace of gum on inlet valve
7	Commercial Gasoline No. 2...	4	....	19	0.00	....	1310	1.10	16¾	No gum deposit in inlet passage or in cyl.
8	Fuel No. 8-A (Fuel No. 1 with dissolved gum).....	39	....	69	0.29	4.84	1230	0.93	17¾	Considerable gum deposit inside of cyl. head
9	Fuel No. 8-B (Fuel No. 1 with dissolved gum).....	12	....	46	0.12	3.09	1260	0.87	17¼	No gum deposit inside of cylinder head
10	Vapor phase Gasoline No. 9..	4	150	51	0.00	....	1280	0.98	15¾	No gum deposit in inlet passage or in cyl.
11	Vapor phase Gasoline No. 11 (freshly distilled).....	8	850	712	0.00	1.29	1280	1.01	19¾	No gum deposit in inlet passage or in cylinder
12	Fuel No. 8-C (Fuel No. 1 with dissolved gum).....	18	....	32	trace	1.17	960	0.00	28	Trace of gummy deposit on inlet valve
13	Same as Fuel No. 8-C.....	18	....	32	0.27	1.24	1220	0.98	19½	Some gum deposit inside of cyl. head
14	Vapor phase Gasoline No. 10.	12	170	453	0.09	3.04	1240	0.71	19	No gum deposit inside of cyl. head
15	Fuel No. 12-A (Fuel No. 1 with dissolved gum).....	26	....	81	0.20	2.88	1230	0.75	19½	Considerable gum deposit inside of cyl. head

still unstable and then obey the sunlight reversion laws.

"(b) In sunlight. This is due primarily to oxidation and subsequent polymerization or condensation. It is progressive and ultimately effects a large portion of the oil. Only the most drastic removal of large quantities of hydrocarbons can prevent this change.

"The above properties are shared in common by petroleum fractions from several sources, e.g., certain American kerosenes, Badarpur crude oil, Assam and East Indian oils and others."

Rogers, Grimm and Lemmon[6] state that color formation in cracked distillates is usually considered to be due to polymerization of unsaturated compounds, but that no definite experimental evidence has been reported on the question. In order to determine whether oxygen is essential to color formation they carried out comparative experiments with and without oxygen.

Cracked kerosenes were filtered through clay from which air had been removed and an inert gas substituted. The clay improved the color of the oil from 5 to 21 Saybolt and no change resulted after 65 hours. In the presence of air and oxygen some color formed in the first 10 minutes and at the end of 65 hours the color was very noticeable.

[6]Ind. Eng. Chem., 18, 164, 1926.

The authors add that although it is certain that under their conditions the color formation was due to oxygen it does not follow that some polymerization does not occur, and that under widely different conditions, such as vapor phase treatment with clay, it is quite probable that the reaction is entirely due to polymerization.

Rue[7] has shown that the mercaptans cause the greatest color change in gasolines of a number of sulfur compounds tried. These were thiophenol, isoamylmercaptan, n-butyl mercaptan, ethyl disulfide, ethyl sulfide, isoamylsulfide and allylisothiocyanate.

The heavy fractions of light distillate, are the ones that go off color most readily; hence in some cases in order to obtain, say a 25 color product, to meet certain specifications, some yield of gasoline has to be sacrificed, unless a heavy expensive treatment is given the oil.

Fluorescence

Brooks[8] largely ascribes fluorescence in distillates to benzenoid hydrocarbons in that these are apparently present in all crude oils and are formed in slight or considerable degree when oil is cracked. In support of this view Brooks finds:

"(1) Oils distilled in vacuo are much less fluorescent than when distilled at higher temperatures that produce some or much cracking, the cracking reactions being productive of benzenoid hydrocarbons.

"(2) No fluorescent organic substances are known which strictly belong to the paraffin or naphthene series of hydrocarbons. The vast majority of fluorescent organic compounds whose constitution is known possess condensed ring structures such as the derivatives of benzene, naphthalene, anthracene, fluorene, pyrone, acridine, azine, oxazine, thiazine and the like.

"(3) The fluorescent substances are readily sulfonated by strong sulfuric acid, forming water-soluble compounds whose aqueous solutions are strongly fluorescent."

[7]U. S. Bureau of Mines, Reports of Investigations, Serial No. 2862, Mar. 1928.

[8]Jour. Am. Chem. Soc. Feb. 1916.

Gum

One of the earliest references to gum formation is that of Wm. A. Hall,[9] who developed vapor phase cracking processes in England, beginning with the year 1914. He noted gum deposits from vapor phase gasoline and believed that they were oxidation products. He called attention to the advantage of gasoline from high temperature cracking but he was ahead of the times.

Leslie[10] states that those gasolines that contain over 20 per cent of ole-

[9]J. Inst. Pet. Tech., 1915, p.147.

[10]E. H. Leslie, Motor Fuels, 1923, p.525.

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fins are frequently found to cause trouble by the formation of gummy deposits, and that the latter are probably caused by easily oxidized and polymerized diolefins.

Smith and Cooke[11] found that oxygen was necessary in gum formation and found aldehydes, including formaldehyde in gum from gasoline. Gums which they isolated by prolonged drying became hard brittle resins. They had a composition similar to certain synthetic resins prepared by T. H. Bakeland. Because of this comparison the compounds responsible for the resin formation would be aldehydes and phenols, or closely related bodies.

Brooks[12] takes issue with Smith and Cooke's statement wherein they are inclined to regard the resins or "gums" as condensation products of aldehydes, probably formaldehyde. Brooks finds that the amount of resin (gum) formed in carrying out the usual evaporation test is not increased by the addition of formaldehyde or other simple aldehydes and ketones. He also quotes Nastjukoff as finding an energetic condensation reagent such as sulfuric acid, or hydrochloric acid (Ormandy) necessary to produce resinous substances from formaldehyde and olefins, and states that even small proportions of these yield simple condensation products, such as the glycols and unsaturated alcohols, noted by Prins.

Brooks finds that the first step in gum formation in cracked gasoline is the formation of organic peroxides[13] which break up forming aldehydes, ketones, water, and carbon dioxide and on further oxidation form organic acids. The fluid gums he finds consist mostly of organic peroxides and fluid aldehydes and ketones. Fully oxidized resin is mainly resin acids, not aldehyde condensation products. Brooks adds that a small amount of diolefins promote the formation of a large amount of gum. Ordinary olefins oxidize to form gums but at a much slower rate.

It is also commonly stated by many that the diolefins are largely responsible for gum formation. They are known to be bad gum formers. Reference has already been made to the finding of diolefins in the products when oil was cracked to make gas. Armstrong and Miller, Noyes and Engler and Standinger have worked on this problem. Dunstan[14] states that butadiene may be present in gases from vapor phase cracking systems to the extent of 1.2 per cent.

Brown[15] has shown that gum deposited from carburetted water gas consists chiefly of oxidation products and polymers of styrene and indene. They result from the high temperature decomposition of oil and coal. Whether lower temperature liquid phase gasoline cracking processes produce the same kind of gums is conjecture but it seems that there should be a close relationship between the products formed, the main difference being that more gum would be formed from high temperature cracking.

Recent work on gums is that of Vorhees and Eisinger[16] who found that when oxygen is passed into gasoline there first occurs what is called an induction period during which time the oxidation rate is very low and relatively constant. After this period the time required for the formation of a large amount of gum is relatively short. The more stable stocks oxidize at about the same rate as the unstable ones. When oxidized samples were evaporated with steam it was found that for any given gasoline there was a relatively constant relation between the weight of gum produced and oxygen absorbed. This indicated that under these conditions at least, gum formation was a result of oxidation only.

Vorhees and Eisinger recognize two types of gum; one they call actual gum and the other potential gum. The first is the gum already formed and the second means the tendency towards gum formation. A non-gum forming gasoline may have become contaminated with a little gum by blending and another gasoline, say freshly distilled, and a much worse gum former, may have little or none in suspension, but may form considerable gum on standing.

The preformed gum may be determined by steaming the gasoline to a constant weight residue at 212 F. The potential gum is determined by heating the gasoline with oxygen at 210 F. for 5 hours, transferring to an evaporating dish, evaporating the gasoline with steam and weighing the residue.

They found, as have many others, that the ordinary copper dish test is not reliable enough for purposes of standardization. The volatile portion of the sample, which can form gum as rapidly as the heavy portion, evaporates away quickly and is thus exposed to atmospheric oxidation but a short time. No corelation was found between color and gum formation.

In engine tests to determine the effects of gum, it was found that a gasoline may have a high potential gum content as shown by the copper dish and oxygen gum tests and yet give satisfactory performance in an engine. On the other hand a gasoline which contained a somewhat larger amount of preformed or actual gum, gave an appreciable deposit of gum in an engine.

The explanation is that only actual gum deposits on the hot surfaces of the inlet passages. Contact is not long enough to deposit potential gum. In the use of an overhead valve engine no trouble was experienced in any of the tests with valves sticking, although the authors surmised that valve sticking would manifest itself sooner or later with "ell" head motors. Further, the amount of deposit inside the cylinder head was not found to be in any way connected with the gum content of the fuel.

As a result of the tests summarized in table I, the authors assume that more than 10 milligrams of actual gum per 100 centimeters at the time of use may produce a noticeable deposit in the motor inlet passages and valves and that a gasoline which forms less than 10 milligrams of gum in the oxygen test (25 centimeters) will not form enough gum on storage for at least a year to impair its value.

Wagner and Hyman[17] note that much material may separate out from cracked gasoline that is not all true gum, although it contains some. True gum is a viscous resinous material left by evaporation and which causes sticky motor valves. The former they call pseudo gum or gum forming material as distinct from true or residual gum. They also find that pseudo gum formation is due to the time of exposure to the atmosphere, concentration of oxygen in the atmosphere over the gasoline, kinds and percentages of unsaturated hydrocarbons present, temperature of the system, rate of diffusion of oxygen through the gasoline, and the extent to which actinic rays or other catalyzing influences may have access to the gasoline.

Wagner's and Hyman's theory of gum formation is that there is a stationary state or induction period

> The fifteenth article of Colonel Burrell's series on modern refining will deal with lubricating oils. It is to be published in the Mar. 19 issue.
>
> A thorough discussion of the significance of various tests of lubricating oils will be given with information about desirable qualities which oils should possess.
>
> In that part of the article devoted to production methods the writer will speak of vacuum and steam distillation, wax removal, use of such solvents as diphenyl, and other important phases of manufacturing practice.

[11]Reports of Investigations. Serial No. 2394, Sept. 1922. U. S. Bureau of Mines.

[12]Ind. Eng. Chem., 18, 1198, 1926.

[13]There is general agreement with Brooks in this step.

[14]Before Roy. Soc. Arts. Jan. 1928.

[15]Gas Age Record. 50, 571 (1922).

[16]Before Am. Pet. Inst., Chicago, Ill. Dec. 7, 1928.

[17]Before Am. Pet. Inst., Chicago, Ill., Dec. 5, 1929.

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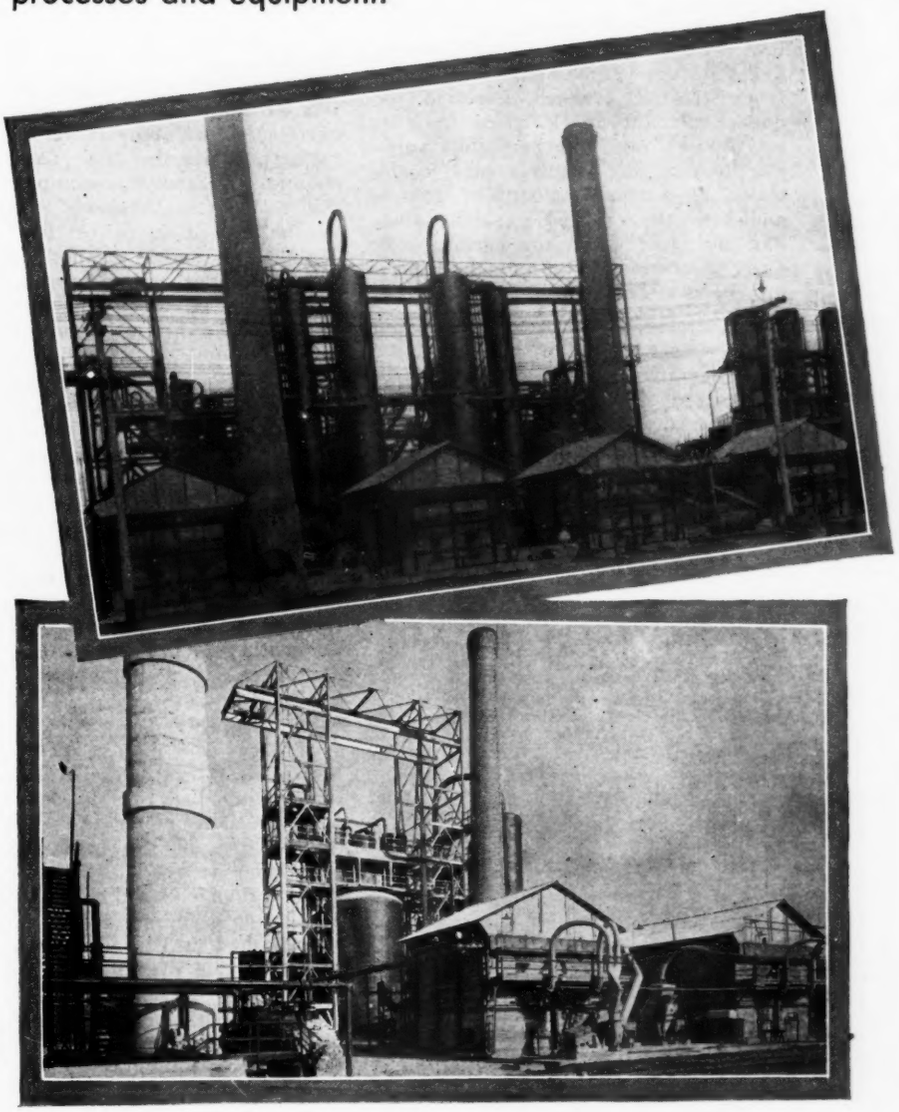

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when no pseudo gum forms for a long time, due either to absence of light or the formation of certain hydrocarbon-oxygen products which later catalyze gum formation. These catalysts may be acids; of the per-acid type. Oxidation of the olefin bond adds two oxygen atoms, giving a type compound.

These oxidize further, splitting the double bond and forming aldehydes and ketones, the former at least absorbing oxygen to produce the catalytic per-acid. Next an oxonium compound is formed regenerating the per-acid, and a hydrocarbon peroxide, which breaks into an aldehyde and a ketone, the aldehyde being further oxidized in the presence of the per-acid. Pseudo gums are of the oxonium type, and its degradation products, i.e., esters and acetals. These oxonium compounds, when heated in non-aqueous solutions, tend to form glycol esters, which polymerize with loss of water to form ester, olefins and furan derivative gums. These make up residual gums.

Mardles and Moss[18] conclude, following Brooks, that formation of organic peroxides, followed by decomposition, by polymerization and by auto-oxidation, cause the formation and separation of resinous material. Gum formation from different fractions of vapor phase gasoline after two months storage at 35 C. obtained by them follows:

		Gum mgs. Per 100 c.c.
To 64°C.	10%	4200
64-70	20	130
70-80	30	70
82-87	40	87
87-100	50	135
100-108	60	25
108-115	70	20
115-122	80	6800
122-135	90	150
135-150	100	3650

[18]Jour. Inst. Pet. Tech., Dec., 1929.

The variation in gum from different fractions is noteworthy, probably due, the authors say, to variations in the quantity of gum forming hydrocarbons.

Hunn and Fischer[19] use two different tests to record gum formation. In one of them gasoline is evaporated to dryness by directing a stream of air on it. In another test, an accelerated one, the gasoline is heated under pressure, with oxygen, at 212 F. A gasoline that maintains its pressure for 1½ to 2 hours is considered safe, probably, for storage. The limit of safety for dissolved gum they found to probably be 10 to 25 milligrams per 100 centimeters of gasoline.

The gum question may be a very real and serious one at some refineries.[20] The writer has in mind one refinery where gum finally depositing from treated cracked gasoline, reduces the anti-knock value from a satisfactory one to a negligible value. Fortunately this requires considerable time. If a small amount of gum is added to the cracked gasoline which has not had time to deposit some gum, the formation of gum is speeded up enormously.

An interesting phenomenon at this same refinery lies in the fact that when straight run gasoline is added to cracked gasoline, in quantity, no gum forms. The cause of the loss in anti-knock value coincident with gum formation, may be due to the formation of a small quantity of oxidation products. Peroxides, if formed, would probably produce a gasoline of decided knocking properties. The author understands that the situation at the particular refinery in question has been materially remedied by adding a small quantity of an anti-oxidant material to the fresh gasoline.

[19]Before Am. Pet. Inst., Jan. 1930, p.31.

[20]Particularly those that make vapor phase gasoline, or to use better terms, gasoline made by high temperature processes.

Anti-oxidants that inhibit oxidation of rubber are phenol, tannin and hydroquinone. They also inhibit oxidation of various oils and resins. A condensation product of aldol and a naphthylamine, and another substance, a condensation product of acetaldehyde and aniline, have found technical application in the rubber industry as anti-oxidants. From 1 to 3 per cent of the material is employed. In the course of time the anti-oxidant becomes consumed.

Some of the above materials have been found to retard gum formation in cracked gasoline. Rysselberge[21] considerably retarded oxidation in transformer oil by adding a trace of hydroquinone. Egloff, Faragher[22] and Morrell, have determined the effect of inhibitors in checking the formation of gum and color compounds in gasoline and depreciation of knock rating of gasoline due to oxidation changes. Aniline, hydroquinone, naphthalene and anthracene were found to inhibit, in more or less degree, changes in knock rating. Naphthalene, urea, pyrene, phthalic anhydride, and carbazole were effective in inhibiting gum formation in Mid-Continent gasoline.

Inhibitors may prevent decrease in knock-rating, but not prevent gum formation. Substances like pseudocumene, l-methyl-naphthalene, b-methyl naphthalene and gum camphor, diminished color formation in a Mid-Continent cracked gasoline. Gasolines were restored to their old knock ratings by treating with sulfuric acid, fullers earth, caustic soda[23] and borax in rerun stills. Also by treating the gasoline with reducing agents like sodium hydrogen sulphite, stannous chloride and acid and zinc.

Odor

Unrefined cracked distillates have sharp and disagreeable odors. This may be due in part to unsaturated compounds, not the mono-olefins, for their odor is good, but those of conjugated doubled bonds. This odor will develop on standing. Sulfur and nitrogen compounds can also contribute to the bad odor of distillates, and secondary and tertiary alcohols formed by the action of sulfuric acid on olefins contribute. Cracked distillates that are adequately refined possess a characteristic but not unpleasant odor.

[21]Chemie et industrie, Special No. Feb. 1929, p.275.

[22]Am. Pet. Inst., Chicago, Ill., Dec. 5, 1929.

[23]Thos. Midgely informed the writer that he found treatment with caustic potash to be excellent.

—*Curtiss Flying Service—Photo Div.*

Aerial view of ocean terminal of the Seaboard Midland Petroleum Corp. and the Seaboard Terminals Corp. at Baltimore

Of the total imports of 975,000 pounds of greases by Peru in 1928, 937,000 pounds were furnished by the United States.

New Patents

Prepared by R. E. Burnham, patent and trademark attorney, 1343 H Street, N. W., Washington, D. C., from whom copies may be obtained at the rate of 20c each. State number of patent and name of inventor when ordering.

February 25, 1930

REFINING

Absorption process—Paul D. Barton, Los Angeles, Cal., assignor to United Oil Co., same place. Filed May 4, 1926. No. 1,748,051.

Process of cracking hydrocarbons—Gustav Egloff and Jacque C. Morrell, Chicago, Ill., assignor to Universal Oil Products Co., same place. Filed June 28, 1926. No. 1,748,065.

Process for the conversion of hydrocarbon oils—George F. Benhoff, Philadelphia, Pa. Filed April 1, 1924. No. 1,748,201.

Fractionating system—Maurice B. Cooke, Plainfield, N. J., assignor to Atlantic Refining Co., Philadelphia, Pa. Filed July 24, 1925. No. 1,748,411.

Process of producing stable hydrocarbon oils—Benjamin T. Brooks, Sound Beach, Conn., assignor to Gray Process Corporation, Newark, N. J. Filed Oct. 10, 1925. No. 1,748,507.

Method of fractionation—Maurice B. Cooke, Plainfield, N. J., assignor to Atlantic Refining Co., Philadelphia, Pa. Filed July 24, 1925. No. 1,748,508.

Method of fractionation—Richard B. Chillas, Jr., Philadelphia, and Albert G. Peterkin, Jr., Bryn Mawr, Pa., assignors to Atlantic Refining Co., Philadelphia. Filed Nov. 24, 1925. No. 1,748,595.

Fractionating-column—Richard B. Chillas, Jr., Philadelphia, and Albert G. Peterkin, Jr., Bryn Mawr, Pa., assignors to Atlantic Refining Co., Philadelphia. Filed Nov. 24, 1925. No. 1,748,704.

Bubble tower (for dephlegmating hydrocarbon oil)—William E. Teter, Wood River, Ill. Filed Feb. 18, 1928. No. 1,748,855.

PRODUCTION

Pipe-cutter—Robert A. Lincoln, Wichita Falls, Tex., assignor of one-half to American Iron & Machine Works, Oklahoma City, Okla. Filed May 31, 1928. No. 1,748,357.

Air-lift control—Leslie C. Mingus, Irwin L. Dunn, and Harold S. Crooks, Tulsa, Okla., assignors to Air Lift Development Co., same place. Filed Oct. 15, 1928. No. 1,748,361.

Method of forming gravel packs for wells—Thomas W. Thorpe, Des Moines, Iowa, assignor to Thorpe Bros. Well Co., same place. Filed March 28, 1928. No. 1,748,589.

MISCELLANEOUS

Rip seam—Charles H. Haupt, Elizabeth, N. J., assignor to Standard Oil Development Co. Filed May 17, 1928. No. 1,748,222.

Closed-pontoon floating deck for oil-tanks and process of producing same—James F. Kimbell, Los Angeles, Cal., assignor to Consolidated Steel Corporation, same place. Filed July 11, 1928. No. 1,748,231.

Foreign Opportunities

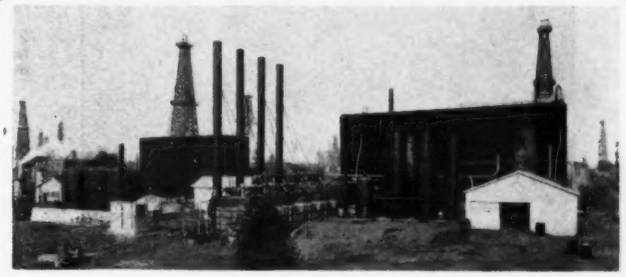
Reserved information may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, and its district and cooperative offices by duly registered firms and individuals upon written request by opportunity number. The Bureau does not furnish credit ratings or assume responsibility as to the standing of foreign inquirers; the usual precautions should be taken in all cases, and where no references are offered it does not necessarily imply that satisfactory references could not be given. Correspondence may be in English unless otherwise stated.

43659.—**Lump paraffin**, Havana, Cuba, purchase.

43661.—**Petrolatum, lubricating oils, and petroleum coke**, Frankfort, Germany, agency.

43662.—**Naphtha**, Trieste, Italy, agency.

Billions of Bubbles



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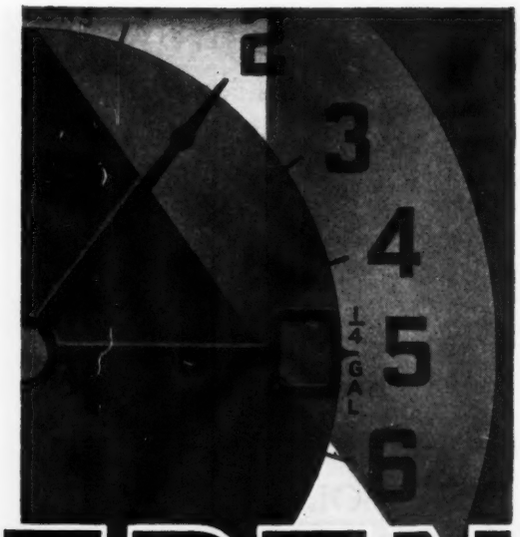

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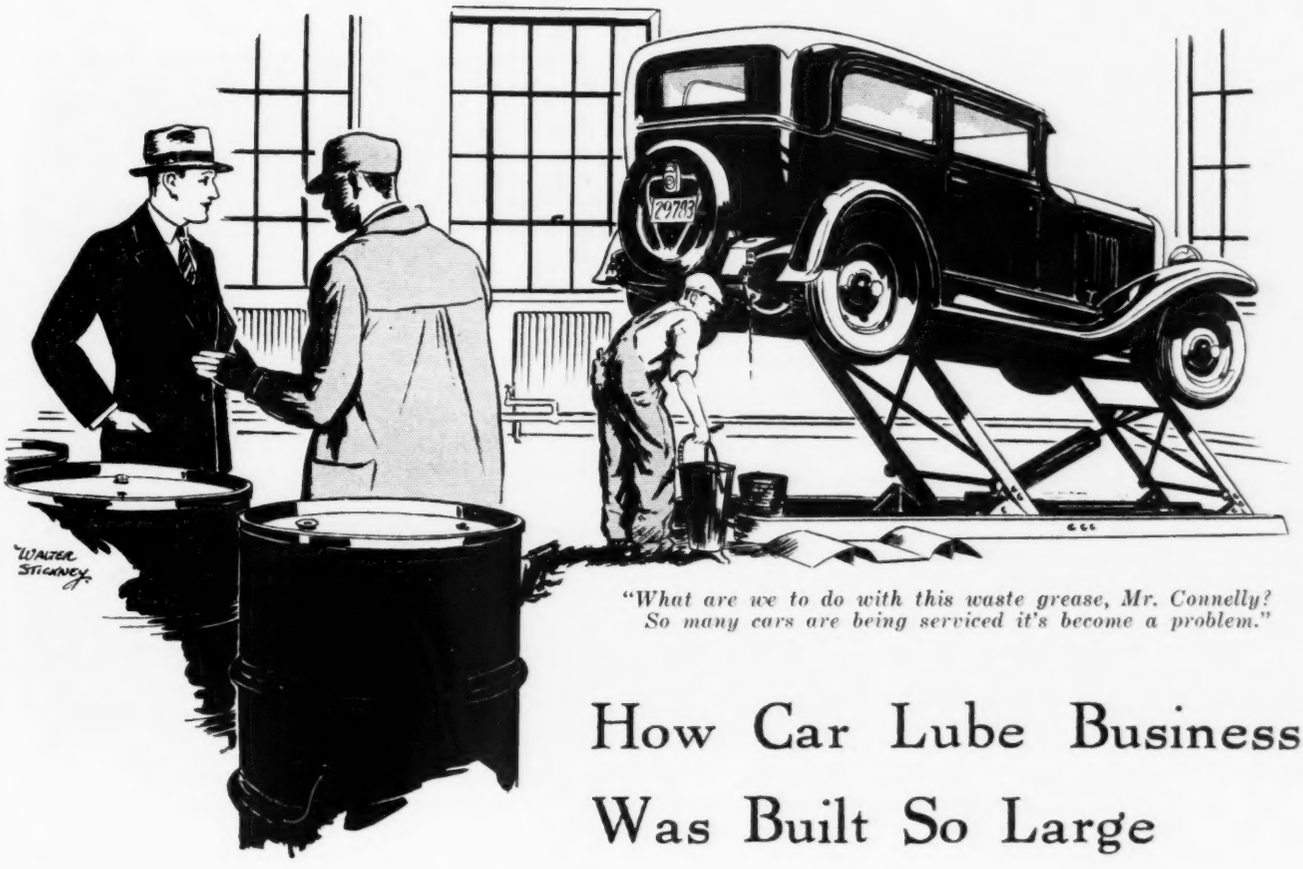


"What are we to do with this waste grease, Mr. Connelly? So many cars are being serviced it's become a problem."

How Car Lube Business Was Built So Large Waste Grease Disposal Became Problem

By Roger B. Stafford
N. P. N. STAFF WRITER

HOW would you like to refill so many transmission and differential housings that disposal of the waste gear compound would become a problem?

If the refilling were being done at a good profit you probably would not consider disposal of the waste grease a matter of great consequence. Nevertheless, it became a problem for the Connelly Chevrolet Co. of Springfield, Ill., which operates a washing and lubrication business in connection with its car agency.

J. F. Connelly, head of the agency, disposed of it eventually by selling the grease to a farmer for slushing compound, but here is how he built such a lubrication business that he had to concern himself with its removal. His general plan may be adapted, with modifications, for use by any oil company or one-stop station operator that wishes to build a profitable lubrication business.

The kernel of the Connelly plan, boiled down to one descriptive word, is SALESMANSHIP.

Mr. Connelly put his car selling organization more than a year ago to selling lubrication and washing service to the 1700 Chevrolet owners of Springfield when car sales underwent their seasonal recession. Now he is lubricating more than 1600 of the present 2000 Chevrolet cars in the Illinois capital. He is getting more than 80 per cent of the cars he regards as his maximum possible market. He is not soliciting the patronage of owners of other makes, but is leaving them for the other automobile dealers and the oil companies that have lubrication and car washing facilities.

Mr. Connelly put his salesmen on a salary basis during the dull car selling season, and apportioned the Chevrolet owners of the city among them. He set a quota of five calls per day per man and sent them forth to tell the Chevrolet owners why they should have their cars lubricated regularly and how inexpensive was the lubrication item of maintenance.

He had installed two Weaver freewheel car lifts, one for the car washing department and one for the lubrication work. In January, 1929, these two lifts were used to service 453 cars but by August the number had risen to 847.

In January last year after all costs, including material, labor, rent, depreciation on equipment, and all overhead expense, the two lifts paid a net profit of $73.13 but by August the service had been increased until the net return was $612.58 with a monthly average of $400 to Aug. 31. In November, when a special winter gear compound drive was made, net profits rose to $637.77, although 67 fewer cars, or a total of 780, were serviced than in August.

Once a salesman influenced a Chevrolet owner to try the service, the customer was followed up with reminders by mail. Large charts were prepared to show when a car was brought in and the type of service it received. The charts are still in use. When a chart shows that a Chevrolet owner has not called for a longer time than is normally required to drive 500 to 1000 miles, a special salesman is sent to him to ascertain why he hasn't called. This special salesman was put on the service work after the car salesmen returned to their regular duties.

The chart gives a picture of the frequency of calls of each of the more than 1600 cars on Mr. Connelly's list of customers. The sheets are large, having a line for each of 100 cars on a sheet and each line having space for the name and address of the car owner, and a small square for each day for 12 months. In operation, colored lines are drawn across the sheet, one space each day a car owner has not received service

on his car. When he calls for service the color is changed and the line continued until he calls again. A small symbol may be used to show the type of service.

The charts are kept up to date by a clerk who notes each day the cars that have been into the station. This information is obtained from the service cards turned in by the service department. After the calls have been noted it is necessary only to extend the colored lines that represent the other customers' cars. When there is no break in color for a long time, the special salesman knows he has to call on the owner of the car represented by that line.

Early in November a special price was made for preparation of cars for winter driving. For $7.50 the Connelly company would call for and deliver a car at any time convenient to the owner; completely lubricate all bearings; flush the transmission and differential and refill with winter lubricant; file and adjust distributor points; clean carburetor screen, carburetor bowl, and vacuum screen; clean and adjust spark plugs; clean generator commutator, and set charging rate.

This offer brought in many cars and the grease rack report for November shows 413 customer cars were lubricated. Grease sales averaged 400 pounds a week at 35 cents a pound. Each car that received the special service took six pounds, making the gross sales of gear compound approximately 560 for the month.

Total grease and greasing sales for the month amounted to $777 and oil sales to $644.78. Many cars were washed when they were brought in and the one stall car wash did a gross business of $530.38. Gross sales of oil, greasing and washing amounted to $1952.16 in November.

The department's income report for the month was as follows:

Departments	Units	Sales	Costs Including Labor	Gross Profit	Overhead	Net Profit
Oils	313	$644.78	$435.66	$209.12	.....	$209.12
Grease rack	482	777.00	340.85	436.15	$130.00	306.15
Wash rack	298	530.38	277.88	252.50	130.00	122.50
Total	.....	$1952.16	$1054.39	$897.77	$260.00	$637.77

These figures do not include the portion of the $7.50 of the special price that was prorated to the car repair department.

In the eight months ended Aug. 31, 1929, the three departments mentioned netted the companies $3201.55. This net figure was more than double the cost of all the equipment required for the services sold.

In calling on their prospects Connelly salesmen emphasized in a subtle way that *pride of ownership* necessitated taking the best of care of the car. They told their prospects that only the most modern equipment was used in lubricating and washing a car at Connelly's. The business of the wash rack at the agency's station rose from an average of six cars to 15 cars a day at $1.50 a car.

A chassis lubrication brings in $1 a car and the flushing of transmission and differential and changing of compound brings in $3.50, of which $2.10 is for six pounds of compound and $1.40 for the labor.

In laying out his greasing and washing departments Mr. Connelly got the advice of G. W. Benedict, head of the planning department of the Weaver Mfg. Co., Springfield. No corners were cut to minimize expense but no extravagance was shown. The equipment was selected for its good quality and efficiency rather than for price.

That the service has pleased the car owner public it was planned to serve surely is proved by the expanding profits of the oil, grease and washing departments month by month since they were modernized. If the service had failed to please, Mr. Connelly and his service manager, H. D. Wetzel, would not have been confronted in early December with the problem of disposing of waste gear compound.

"Better see these people today, Jim. They haven't been in yet this month."

Merchandising and Jobbing Ideas Marketers Are Practicing

By E. L. Barringer
N. P. N. STAFF WRITER

THE Huntington-Polk Oil Co., Huntington, Ind., operates a tank truck on rural routes with the driver on a commission and a salary. Paul F. Schroeder, secretary and treasurer of the company, says the method has been satisfactory, and a commission may be paid to other drivers as they are added to the force.

The driver is given a salary of $50 a month. His commissions are ½ cent on gasoline and kerosene delivered to dealers, ¾ cent on gasoline and kerosene to farmers, 5 cents a gallon motor oil, and 1 cent a pound on grease.

The company was organized a few months ago to sell Marland products. In changing over to the Conoco brand, following Continental Oil Co.'s merger with Marland, Mr. Schroeder said he encountered no difficulties, almost all his customers continuing to buy the new brand.

* * *

Income Statements Cover Each Station

A profit and loss statement is prepared each month for all service stations of the O'Day Oil Co., at Fort Wayne, Ind. T. J. O'Day, the owner, checks over these statements to see how each of his retail outlets is coming along. He has found these statements helpful in bringing to light quickly any weaknesses in his sales organization.

* * *

Familiarity With Trade May Have Bad Effect

Too much familiarity between service station attendant and customers is a problem in management for some jobbers. To have the attendant familiar and on friendly terms with the customer is a desired quality, but it can be overdone to the point of breaking down the company's standard of service.

An attendant familiar with his customers may feel it beneath his dignity to wipe off the windshield, or check the radiator and crankcase oil without being asked.

One Indiana proprietor, who relieves his station man at meal time, found he was falling into this habit also. After a few months he was inclined to chat with the customers, sell the goods asked for, but slighting those extra touches that make up service. To correct this error he is preparing for a general shake-up of his service and is going to include himself in enforcing a strict adherence to his standard of service.

* * *

More Attention To Bookkeeping

Marketing organizations could well afford to give less time at conventions to addresses on salesmanship and more time on bookkeeping methods, is the opinion of one jobber. Which is another way of saying what has been said many times—less attention to gallonage and more to net profits.

* * *

Roadside billboards of the Patton-Henry Co., in Fairmont, W. Va. are tied into the retail outlets through use of the numeral one to indicate one-stop service. Patton-Henry's retail outlets operate under the name of DeLuxe Service, Inc. Prominent on the billboards is the numeral one with the words "one stop service." At the company's one-stop station in Fairmont is a cut out sign, about six feet high, with the same numeral one and the same wording.

* * *

Charleston, W. Va. is to have a large one-stop service station selling Firestone tires and Standard Oil Co. of New Jersey gasoline. A permit has been taken out for a $45.000 building, on a lot 100 by 120 feet, at Washington and Dickinson street. The station is to have seven gasoline meters.

* * *

Bulk Hauling Reduces Lube Delivery Costs

Walter Drompp, White Star Motor Oil Co., Logansport, Ind., figures he saves 10 cents a gallon on distributing costs of motor oil by transporting it in truck lots from his bulk plant to dealers and stations.

T. J. O'Day, of the O'Day Oil Co., Fort Wayne, Ind., likes to haul his oil to stations in freshly painted drums, and bucket it to the station containers.

Every time a drum returns to the bulk plant it is painted in the company's colors—yellow and black—and a new stencil put on the head.

"Its the old story about telling a man that he is sick and eventually he believes it," said Mr. O'Day. "We keep telling our station men that we have a mighty fine grade of oil. To carry out this idea the oil goes to the station in freshly painted drums. The men see the clean way in which we handle the oil and it makes an impression."

And here probably are only two ideas of the task of moving oil from a bulk plant to a service station.

* * *

Don't Sell Aspirin

Aspirin is a good item not to sell at a service station. A United States court has ruled, against a grocery store in this case, that aspirin should be sold in drug stores.

* * *

New Record for Gasoline Bucketing

Ted Dewey, Cheney, Kan., writes NATIONAL PETROLEUM NEWS that he has a record for one day bucketing of gasoline off a tank truck that beats the record made by Clarence Snyder, agent at Hillsboro, Ind., for Geo. W. Deer & Son. Mr. Snyder's record was 1432 gallons of gasoline and kerosene bucketed to the farm trade in one day.

"I wish to tell you and Mr. Snyder that I have already beaten him," writes Mr. Dewey. "I have bucketed to the farm trade 2200 gallons of gasoline and kerosene, not only on one day but on several. But I will say that it certainly was not an easy day's work. Last summer, through the harvest season, I put out from 1500 to 2200 gallons every day with one truck. I am just writing you to tell you that Mr. Snyder will have to do better than that to hold the high record as I sure have him beat."

* * *

Temperature Correction For Alcohol?

Do you think it is necessary to have a temperature correction in purchasing denatured alcohol? This question came up at a recent meeting of officials of a state jobbers organization. An agent for a large refiner suggested that two temperatures be established, one for summer the other for winter.

* * *

Larger Station Tanks Help Cut Costs

One jobber literally is sticking his nose instead of the hose into the

gasoline tanks at his service stations. Object of the search is to see if operating expenses can be reduced. Most of the tanks at his stations are of 500 gallon capacity. He is doing some figuring to see if 1000 gallon tanks would help reduce costs through fewer tank truck deliveries. Incidentally this jobber has had a good increase in business, both dollars and gallons, in recent years while the even keel of his operating expenses would be envied by many jobbers.

* * *

Direct Mail to New Car Owners

The Elk Refining Co., Charleston, W. Va., operates what it terms its mail order department to solicit business of new automobile owners.

Each Friday the local credit bureau issues a list showing the name and address of each new or used car purchaser, with the name of the seller, total cost of the car, and how much equity the new owner has. By the next day the Elk Refining Co. has a letter with a booklet on its oil and gasoline, in the mail. The following week another letter with a booklet on greasing is mailed.

* * *

Uses Program Ads

Newspaper advertising is being eliminated from the merchandising plan of the Elk Refining Co., Charleston, W. Va. Instead this appropriation is used for advertising in lodge, labor, church, school, and similar programs and special booklets. The company feels that it is necessary to take space in these programs so it is concentrating all advertising in these media.

The company, however, does not feel that this form of advertising is wasted, or a charity. The reasoning runs like this, the high school gives a play and puts out a program. While the audience is waiting, or between the acts, there is time to run through the program and the advertisements are actually read, and the audience is in a kindly mood toward the advertisers.

* * *

Dealers Sent to Jobber Meeting

Benefits of conventions of the West Virginia Oil Marketers Association are being given to dealers through that state, according to R. D. Lowe of the Elk Refining Co., president of the association. The dealers are brought to the convention at the expense of the jobbers who supply their gasoline and oil. As a rule the jobber will give dealers the privilege of attending the sessions on either day of the convention. The association waives the registration fee. In case the dealer attends the banquet his jobber foots the bill.

1929 Gas Demand Up 12.3 Per Cent in 40 States

NEW YORK

GASOLINE consumption in 40 states in 1929 totaled 9,278,822,000 gallons, according to the American Petroleum Institute.

This compares with 8,286,349,000 gallons consumed in 1928 in these 40 states, an increase of 992,473,000 gallons for the year, or 12.3 per cent increase in daily average. Almost 3,000,000 more gallons were used daily in 1929 than in 1928.

Gasoline consumption in the 40 states in December, 1929 was 687,233,000 gallons, compared with 649,427,000 gallons in December, 1928, a gain of 37,806,000 gallons or 5.8 per cent. Daily average consumption last December was 22,169,000 gallons, or 2,828,000 gallons less than in November.

The accompanying table shows gasoline consumption in December, 1929, and December, 1928, with per cent of change, and consumption for 1929 and 1928, together with per cent of change.

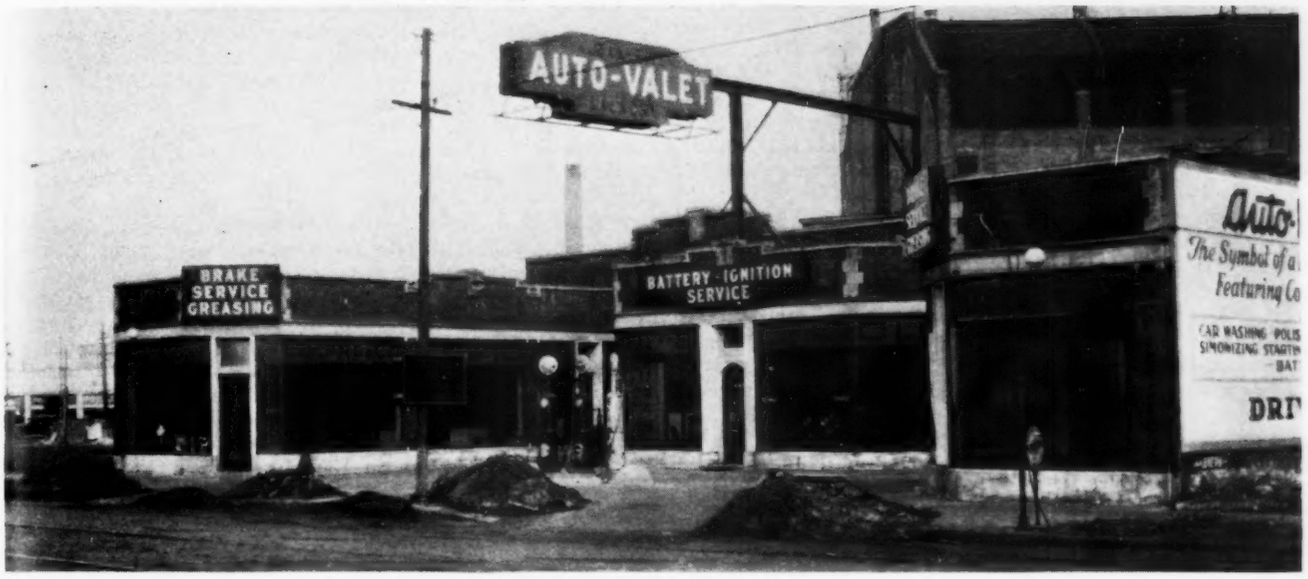
	Tax Per Gallon Cents	Month of Nov., 1929 Gallons	Month of Dec., 1929 Gallons	Month of Dec., 1928 Gallons	% Change over Dec., 1928	12 Months Ending with Dec., 1929 Gallons	12 Months Ending with Dec., 1928 Gallons	% Change over 1928
Alabama	4	14,114,000	13,561,000	14,403,000	— 5.85	184,207,000	168,276,000	+ 9.47
Arizona	4	6,009,000	6,260,000	4,819,000	+29.90	63,995,000	50,455,000	+26.84
Arkansas	5	11,996,000	9,467,000	8,557,000	+10.63	134,606,000	119,184,000	+12.94
Colorado	4	10,646,000	10,390,000	8,829,000	+17.68	156,781,000	142,015,000	+10.40
Delaware	3	1,695,000	3,211,000	2,197,000	+46.15	32,576,000	27,706,000	+17.58
Dist. of Columbia	2	6,036,000	5,785,000	5,499,000	+ 5.20	71,827,000	63,579,000	+12.97
Florida	6	18,593,000	20,530,000	20,042,000	+ 2.43	224,153,000	226,904,000	— 1.21
Georgia	6	18,588,000	18,433,000	18,056,000	+ 2.09	219,266,000	206,138,000	+ 6.37
Idaho	4	4,987,000	3,976,000	3,127,000	+26.86	55,125,000	50,148,000	+ 9.92
Indiana	4	33,869,000	29,603,000	29,982,000	— 1.26	432,995,000	388,466,000	+11.32
Iowa	3	27,532,000	24,381,000	21,659,000	+12.57	335,629,000	306,651,000	+ 9.45
Kansas	3	24,223,000	26,265,000	21,281,000	+23.42	361,165,000	315,671,000	+14.41
Kentucky	5	12,819,000	11,302,000	11,143,000	+ 1.43	154,656,000	134,836,000	+14.70
Louisiana	4	14,514,000	14,659,000	17,056,000	—14.05	175,199,000	169,046,000	+ 3.64
Maine	4	8,032,000	5,137,000	4,690,000	+ 9.53	95,858,000	82,203,000	+16.61
Michigan	3	63,824,000	53,424,000	53,104,000	+ 0.60	785,279,000	673,335,000	+16.63
Minnesota	3	29,148,000	21,718,000	22,987,000	— 5.52	358,063,000	328,434,000	+ 9.02
Mississippi	5	*10,585,000	*10,171,000	11,117,000	— 8.51	*138,157,000	129,157,000	+ 6.97
Missouri	2	33,496,000	29,494,000	27,169,000	+ 8.56	389,765,000	355,001,000	+ 9.79
Nebraska	4	15,879,000	14,935,000	13,241,000	+12.79	214,242,000	198,446,000	+ 7.96
Nevada	4	1,464,000	1,404,000	1,017,000	+38.05	17,813,000	14,378,000	+23.89
New Hampshire	4	6,726,000	3,364,000	3,169,000	+ 6.15	59,898,000	48,235,000	+24.18
New Jersey	2	39,832,000	37,643,000	33,546,000	+12.21	497,718,000	422,348,000	+17.85
New Mexico	5	4,091,000	4,014,000	3,000,000	+33.80	48,458,000	36,793,000	+31.70
North Carolina	5	22,834,000	27,522,000	22,756,000	+20.94	265,112,000	246,087,000	+ 7.73
North Dakota	3	5,787,000	3,762,000	5,386,000	—30.15	124,027,000	117,169,000	+ 5.85
Ohio	4	77,399,000	67,197,000	67,029,000	+ 0.25	955,328,000	860,631,000	+11.00
Oklahoma	4	26,396,000	26,367,000	23,624,000	+11.61	316,894,000	280,781,000	+12.86
Rhode Island	2	5,614,000	5,087,000	5,344,000	— 4.81	79,102,000	65,872,000	+20.08
South Carolina	6	10,490,000	10,112,000	10,205,000	— 0.91	118,596,000	109,938,000	+ 7.87
South Dakota	4	8,387,000	7,441,000	7,413,000	+ 0.38	123,265,000	110,652,000	+11.40
Tennessee	5	16,659,000	16,219,000	14,955,000	+ 8.45	195,036,000	171,276,000	+13.87
Texas	4	(a)64,364,000	65,438,000	59,359,000	+10.24	769,608,000	670,817,000	+14.73
Utah	3½	4,652,000	4,032,000	2,987,000	+34.98	56,546,000	47,634,000	+18.71
Vermont	4	3,684,000	2,419,000	2,470,000	— 2.06	43,992,000	37,312,000	+17.90
Virginia	5	17,672,000	16,548,000	15,746,000	+ 5.09	208,304,000	183,447,000	+13.55
Washington	3	20,711,000	18,705,000	16,907,000	+10.63	253,168,000	227,043,000	+11.51
West Virginia	4	10,672,000	8,980,000	8,519,000	+ 5.41	125,370,000	111,345,000	+12.60
Wisconsin	2	33,529,000	26,274,000	25,337,000	+ 3.70	403,396,000	357,146,000	+12.95
Wyoming	4	2,361,000	2,003,000	1,700,000	+17.82	34,547,000	31,794,000	+ 8.66
Total		749,909,000	687,233,000	649,427,000	+ 5.82	9,278,822,000	8,286,349,000	+11.98
Daily Average		24,997,000	22,169,000	20,949,000	+ 5.82	25,421,000	22,640,000	+12.28
Increase over previous year:								
Amount of Increase		.....	37,806,000	.....		992,473,000		
Percentage Increase In Daily Average		.....	5.8%	.....		12.3%		
Massachusetts	2	40,784,000	34,641,000	.....		.....	.....	

*Estimated

		Quarter Ended Sept. 30, 1929	Quarter Ended Dec. 31, 1929	Quarter Ended Dec. 31, 1928		12 Months Ending with Dec. 31, 1929	12 Months Ending with Dec. 31, 1928	
California	3	287,922,000	323,617,000	276,945,000	+16.85	1,253,324,000	1,101,404,000	+13.79
Montana	5	27,564,000	19,302,000	15,313,000	+26.05	78,293,000	74,272,000	+ 5.41
Pennsylvania	4	253,940,000	246,787,000	200,662,000	+22.98	903,282,000	759,027,000	+19.01

(a) Revised

ADVERTISING PAGES REMOVED



The Auto-Valet, one-stop station in Chicago, where appointments are made for lubrication service. The center show room, and that to the right, are used for polishing autos out in public to create a demand for this service

Services by Appointment, and Contract, To Build Steady Volume

CHICAGO

AN APPOINTMENT service on lubrication is offered by the Auto-Valet, one-stop service station on the far south side of Chicago.

For the convenience of customers a permanent appointment at a stated time each week, month, or any interval may be made, or an appointment may be made on a day-to-day basis. Thus a customer may select 10 o'clock every Monday morning, for instance, or he may call for an appointment when his car needs attention.

The station expects to benefit by the appointment system through building a sustained volume of business, and to avoid crowding at the pits. The service also is part of the station's policy of helping the customer take proper care of his auto through the convenience in service. If a customer is not prompt in meeting an appointment five minutes' grace is granted before any waiting customer's car is serviced.

The Auto-Valet opened for business Oct. 1, and J. P. Nicholson, the president, has been working on methods to build a steady flow of business into his station. In addition to using an appointment system on lubrication he is selling auto washing and general auto inspection service on a future basis. About 85 per cent of his business now is on contract.

A complete service for the auto is sold on a monthly basis, payable in advance, but the customer must contract for 12 months' work. The charge for this type of service ranges from $9 to $11 monthly, depending on the make of car.

The contract provides the customer with the following services each month:

Car washing as desired.
One brake adjustment.
One complete lubrication.
One general shine and polish.
One complete inside vacuum.
One general tightening up of body, fender, and bumper bolts and spring clips.
One checking of generator and points.
One inspection of tires and battery.

For $9 a month this service is sold for those cars in Class A—Ford, Chevrolet, Whippet, and Pontiac. The charge for Class B is $10 a month, and covers the large class of medium priced and a few of the more higher priced cars. Class C is for Cadillac, La Salle, Lincoln, and Rolls Royce, and the charge is $11 a month. With it's present equipment the station is striving to sell this service for 1000 autos.

A car washing service over the month is sold at a flat price also. For $3.50, payable in advance, a customer may have his car washed as often as desired in a month. For $9, payable in advance, this car washing service extends over three months. From 1400 to 1500 customers are using this service now.

Records show that the customers average four to five car washes a month. In case a customer abuses the contract by being unreasonable in the number of washes the company refuses to renew his contract. Some customers have abused the privilege, or tried to run in more than one car under the contract, but on the whole it has been found that customers are reasonable in their demands.

Along with his work in merchandising through selling service on a monthly basis Mr. Nicholson has several innovations in selling the services of his station to the public. His latest plan is to Simonize and Duco polish autos in his show windows.

The station has three sales rooms in front, with show windows facing the street and the entrance and exit drives. One of the rooms is used for a radio sales office and a waiting room for customers. Another room was used for tire displays and the center one was rented to an automobile agency.

The tire and auto display rooms will be used for the Simonizing and the Duco polishing, and the work will be in full view of passing motorists as well as those driving into the station. Mr. Nicholson believes this arrangement will have a psychological

effect on motorists and help the sales of these departments.

"I believe the sight of a car, all bright and shiny, will make motorists want their car to be placed in the same condition," he said. "We hope this arrangement will stress also the need of an intelligent car wash after an auto has been waxed in order that the finish will not be damaged, and the need also of intelligent care in re-waxing the worn spots to get the maximum benefit of the job."

Another innovation in selling was using the salesmanship class of a nearby high school to sell the monthly car washing service. For each contract sold the student was given 25 cents, and the arrangement also provided the class with some practical experience.

This sales plan has been dropped, however, because of the nature of the business and because it was used in a large city, rather than as the result of any fundamental flaw in the method.

"We found that the people were not receptive to the plan at first," said Mr. Nicholson. "There is a natural skepticism about a new place of business in the city and people were not investing $3.50 on what they might think was a 30-day gamble. The nature of this type of business is such that the customer must come in to see what we are offering."

Selling of the station's service is done by three regular salesmen. There are two men who work outside as well as on the floor, selling all services including radios. For radio service a repair man is employed regularly.

The third salesman works on the station floor. He greets customers, makes out the shop tickets, and generally keeps track of cars moving through the station. His contact also places him in a position to sign up the customer again when a contract has expired.

All the contracts on the monthly service are numbered serially, and a register of customers is kept with the name arranged alphabetically. Details of the shop tickets are recorded on the customer register so that a check may be made as the customer's demands for service. An identification card is issued to all customers. To prevent a customer running in more than one auto on the monthly car washing service the register also shows the make and license number of the auto to be serviced under the contract.

All the services sold at the Auto-Valet are radio sales and service, auto washing, complete lubrication, complete brake testing and repairing, lubrication, motor oil, gasoline, fender repairing, complete electrical and ignition service and repairing, polishing, and a limited space for storage.

The radios are sold out in a front show room and it has been found to be an excellent place to contact with customers who are waiting for service on their autos. Radios are sold for cash, and about 200 have been sold in the first four months.

Other services, aside from the change in the polishing department and the gasoline, are done in the rectangular building back of the show rooms.

The auto laundry, a Klean-Rite system, extends to the rear of the building directly in front of the entrance drive. In addition to the devices for car washing by this system the station uses a home-made blower for removing water from the under parts of the chassis.

A mixer, similar to the air and gas mixer of the natural gas stoves, is placed at the end of the blower line. Air is delivered from the compressor tanks through a 1/32-inch opening at about eight cubic feet a minute. Additional air is drawn through the mixer from the atmosphere stepping up the total delivered to about 100 cubic feet a minute.

The electric and ignition department is between the laundry and the near side wall, back of the radio sales room. The department is fully equipped to handle any electrical job for the auto.

In the center of the building, beside the laundry conveyor, are the lubrication pits, and space that was used for auto polishing. At the rear and along the wall are the brake tester and brake repair departments, fender repairing, and the storage space.

The brake testing department is making a bid for business by issuing a card showing the date tested and maximum efficiency of the brakes. The card is intended as a record, in case of accident, that the driver has not been negligent in caring for his brakes.

All departments, excepting the gasoline pumps, are open from 8 a. m. to 8 p. m. during the week and from 9 a. m. to 1 p. m. Sunday. Two shifts of men are employed. Each department is in charge of a workman experienced in his line. The gasoline pumps are open 24 hours a day, an extra man working through the night.

To increase business during the evening hours a few fleets of small trucks are serviced regularly. The trucks are left at the station at night by the driver and called for in the morning. The work is so scheduled that a few trucks are serviced each evening, and so each truck receives the proper amount of attention over the month.

Miss Eleanor L. Kates
Who has begun direct mail or salesmen's call list service for oil companies in New England

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MILWAUKEE—C. N. Maurer, a prominent figure in the Wisconsin State Highway Commission for the past 10 years and author of the new Wisconsin traffic code, has been appointed director of the highway sales division of the Heil Co., manufacturer of truck and storage tanks, dump bodies and hydraulic hoists.

Mr. Maurer is thoroughly familiar with highway development work, having remarked all Wisconsin highways during his connection with the highway department, developed its arterial system and installed the department to handle the weight law enforcement of vehicles.

Girl Starts Mail List Service for Oil Men

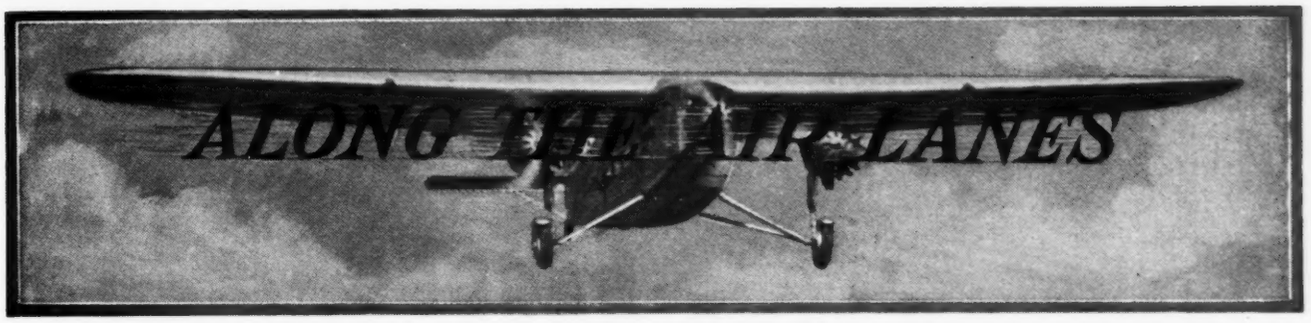
BOSTON, March 10.—A direct mail advertising and salesmen's call list service for oil companies covering the New England states has been established at 126 Massachusetts Ave., Boston, by Miss Eleanor L. Kates and Albert Young.

Miss Kates is widely known in the New England oil trade as she was manager of the Boston office of the Wayne Co., Fort Wayne, Ind., equipment manufacturer, for several years and has been active in assisting the conventions of the Independent Oil Men's Association of New England.

The service reports lists of 25,000 filling station owners, 15,000 oil burner owners, 15,000 motor boat owners, 10,000 garages or automobile service stations, and 1,500,000 passenger car and truck owners in the New England states.

Miss Kates said the firm would conduct direct mail campaigns or just supply mailing or call lists.

ADVERTISING PAGES REMOVED



THE dirigibles and airplanes will extend commerce to all parts of the world and play a major role in world-wide prosperity and peace, is the prediction contained in a statement recently made public by the Aeronautics branch of the Department of Commerce, Washington.

One of these predictions is that instead of using the heavy liquid fuel consumed by today's airplanes and automobile engines, the airship will perhaps use one of several satisfactory fuel gases, such as blaugas, ethane, propane or mephane, or it may be that the Diesel type engine will be developed to the point of practical application, the statement points out.

How the dirigible will fit into the transportation scheme of tomorrow's commerce, what the commercial possibilities of lighter-than-air craft are, and what the future of the airship is, are some of the questions now in the minds of many forward-looking business men. The Aeronautics division has made a few predictions, based upon such recent epochal achievements as the flight around the world by the Graf Zeppelin.

"The ships of tomorrow will undoubtedly be much larger, with more engines," the statement says, "and it is possible that pneumatic floats or other types of gear will be devised so that the air ship of the future will possess certain seaworthy characteristics."

Because the greatest flow of traffic has always been from east to west and west to east, rather than north to south, it seems likely that the first lighter-than-air routes will be east and west, the statement says. A possible result, as demonstrated by the Graf Zeppelin flight, is a scheduled round-the-world service in 20 days or less.

The most likely immediate developments are for transoceanic and long distance overland hauls. Among the first routes to be inaugurated will probably be one from Europe to the United States or from a west coast point to Hawaii.

The fact that lighter-than-air craft can combine with speed and directness of route the ability to carry large cargoes and cruise thousands of miles without stopping, presages the increasing use of these air lines. The expensive flight of time, the world is beginning to realize, can be retarded by flying, according to the bureau.

A WARNING has been sounded by the National Better Business Bureau, Inc., 383 Madison Ave., New York, against commercial aviation schools who are using misleading statements in their advertising tending to show that the school is complying with standards of the U. S. Department of Commerce, when these schools either may have failed to meet the commerce department's requirements, or may not yet have been inspected.

An approved school certificate is given to the aviation school that has been inspected by the Department of Commerce and found satisfactory in equipment, courses, training, etc. Up to Dec. 4, 26 schools had been awarded this certificate of approval.

J. H. McEvoy, Jr., president of the J. H. McEvoy Co., Houston, accompanied by Mrs. McEvoy, recently made a "flying" trip to Los Angeles to visit the local office. Mr. McEvoy and his wife were very enthusiastic over air transportation.

XXX

Officials of the Petroleum Securities Co. flew to Kettleman Hills following the announcement that an explosion had partially destroyed the Los Nietos absorption plant, handling the natural gas production of the Felix I, drilled by this company.

XXX

When a geologist of the Rio Grande Oil Co. has to hurry off to some far-off producing center he tells Lake Littlejohn, chief pilot, and both hop off in an airplane.

The company's tri-motored Fokker plane has been in operation for nine months, being used principally for business purposes and for extraordinary needs. During this period it has flown 60,000 air miles in 500 hours, an average of 120 miles per hour. It carried 1929 passengers, an average of slightly more than seven each day.

Of this number 500 passengers were taken on their first air ride, which the company claims as its contribution toward making this country airminded.

The longest one-day flight of the "Rio Grande" was from Los Angeles to Wichita, Kans., an air mile distance of 1295 miles, which was covered in 11 hours at an average speed of 118 miles per hour.

The first transcontinental flight of this plane required 33 hours, later reduced to 22 flying hours when the 2531 air miles were covered.

The Keystone Loening amphibian of the Standard Oil Co. of Louisiana

Now De-Carbonized

"10-Test" MOTOR OIL

ANOTHER good INDEPENDENT Product made *better!* Now "10-Test" Motor Oil is *De-Carbonized!*

By modern methods of filtering at high temperature, the carbon content of this remarkable oil has been reduced to a trace. At the same time its lubrication qualities have been developed to the fullest!

INDEPENDENT "10-Test" *De-Carbonized* Oil offers two-way satisfaction . . . satisfaction to your customers in a clean, smooth-running motor . . . satisfaction to you in repeat sales and continuous profit.

"10-Test" *De-Carbonized* is an oil you can recommend without a single "if" or "and".

If you are not getting the good business that INDEPENDENT Products are bringing to jobbers everywhere, write us today for full particulars of our liberal sales franchise.

GASOLINE INDEPENDENT MOTOR OIL

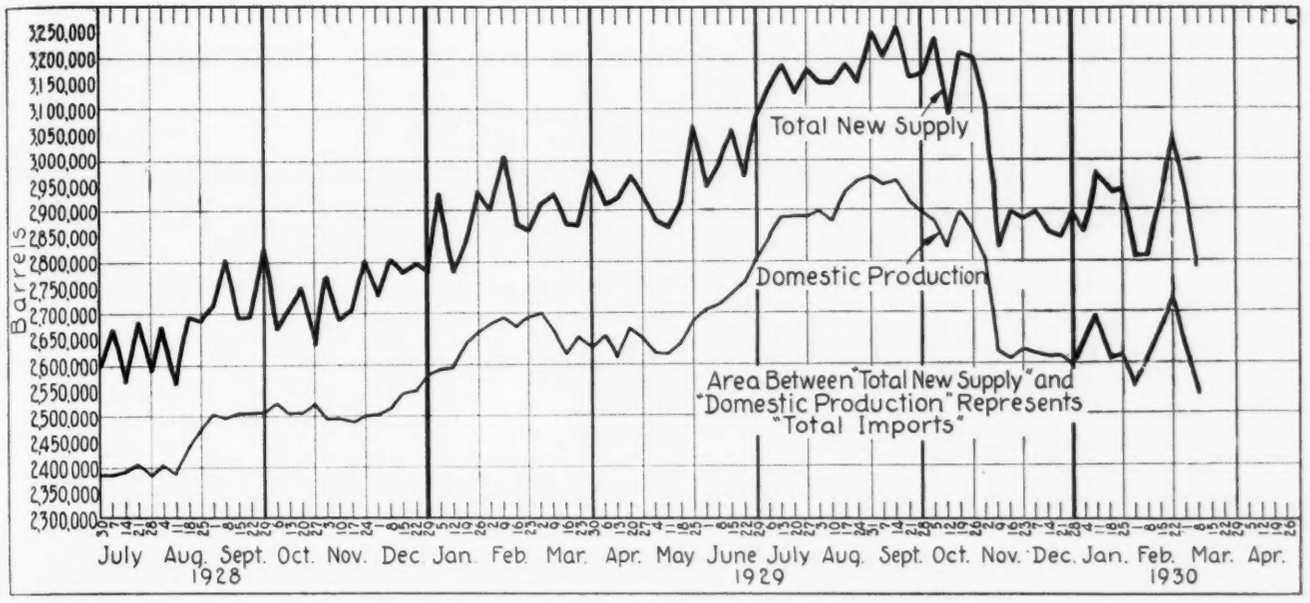
INDEPENDENT OIL AND GAS COMPANY

Producers* . . . . . *Refiners* . . . . . *Marketers

Kansas City TULSA Minneapolis
Omaha Des Moines

(TJ-19)

Daily Average Crude Oil Production and Imports



Daily average gross output, by fields in U. S., for week ending with dates below as compiled by A.P.I.

PRODUCTION SUMMARY	March 8	March 1
Production east of Rockies	1,873,950	1,900,950
Decrease		27,000
Total production in U. S.	2,535,350	2,623,950
Decrease		88,600
Crude oil imports	259,430	285,860
Decrease		26,430
Total crude supply	2,794,780	2,909,810
Decrease		115,030

OKLAHOMA	Mar. 8	Mar. 1
Allen Dome	20,400	19,050
Asher	2,500	2,300
Blackwell	3,100	3,100
Bowlegs	19,600	21,250
Braman	3,600	3,650
Bristow-Slick	16,400	16,450
Burbank	16,600	16,600
Carr City	9,250	10,400
Cromwell	7,400	7,250
Cushing	14,400	14,400
Davenport	1,150	1,200
Duncan District	7,900	7,850
Earlsboro	33,350	33,500
East Earlsboro	41,750	31,500
Fox	1,300	1,200
Garber	4,500	4,450
Graham	3,750	3,700
Healdton	12,000	11,950
Hewitt	7,550	7,450
Hubbard	1,500	1,500
Konawa	8,500	7,200
Little River	38,100	42,000
Little River, East	19,350	15,050
Logan County	9,650	10,000
Maud	5,350	5,800
Mission	11,250	12,800
North Okmulgee	11,300	11,300
Oklahoma City	63,000	83,900
Osage (outside Burbank)	26,350	26,350
Papoose	2,950	2,850
Pearson	850	750
Sasakwa	9,300	9,250
St. Louis	42,850	43,650
Scholem-Alechem	13,800	13,800
Searight	9,150	9,250
Seminole	20,200	21,050
Seminole, East	3,350	3,250
South Okmulgee	6,250	6,250
Thomas	450	500
Tonkawa	8,350	8,350
Wewoka	4,000	4,050
Yale-Jennings	8,150	7,850
Others	53,800	53,200
Total, Oklahoma	604,300	617,200
Decrease		12,900

KANSAS		
Augusta-Fox Bush	2,900	2,900
Churchill	4,500	4,600
El Dorado-Towanda	13,400	13,450
Florence-Covert	850	850
Greenwood County	19,400	19,500
Oxford	2,900	2,850
Peabody-Elbing	3,150	3,150
Rainbow Bend	1,100	1,100
Russell	3,500	3,250
Sedgwick County	22,050	23,500
Voshell	4,900	4,950
Others	35,000	34,600
Total, Kansas	113,650	114,700
Decrease		1,050

NORTH LOUISIANA		
Bellevue	650	600
Caddo, light	10,400	10,350
Caddo, heavy	2,650	2,700
Cotton Valley	2,250	2,100
De Soto and Red River	3,050	3,100
Elm Grove	450	450
Haynesville	4,500	4,550
Homer	3,550	3,600
Pleasant Hill	700	750
Urania	5,050	5,000
Zwolle	5,400	5,300
Others	3,100	3,300
Total, North Louisiana	41,750	41,800
Decrease		50

ARKANSAS		
Champagnolle	4,300	4,300
El Dorado	4,000	4,100
Lisbon	1,050	1,000
Nevada	1,100	1,100
Smackover, light	5,300	5,150
Smackover, heavy	41,200	41,650
Stephens	900	950
Others	250	250
Total, Arkansas	58,100	58,500
Decrease		400

TEXAS (Outside Gulf Coast)		
Panhandle District		
Carson County	8,900	9,400
Gray County	53,300	54,900
Hutchinson County	23,500	23,500
Wheeler County	600	600
Others	600	700
Total, Panhandle Texas	86,900	89,100
Decrease		2,200
North Texas		
Archer County	17,250	17,300
Burkburnett	8,150	8,150
Electra	11,400	11,400
Iowa Park and K. M. A.	5,100	5,100
Montague-Cooke	11,100	11,100
Wilbarger	23,400	24,600
Others	2,200	2,200
Total, North Texas	78,600	79,850
Decrease		1,250

GULF COAST		
Coastal Texas		
Barbers Hill	23,900	24,500
Batson	1,200	1,200
Big Creek	3,200	3,150
Blue Ridge	1,900	1,700
Boling	1,000	1,050
Damon Mound	500	500
Fannett	1,200	1,050
Goose Creek	4,900	4,900
Hull	9,250	9,250
Humble	22,500	18,350
North Dayton	900	1,000
Orange County	2,450	2,200
Pierce Junction	10,700	11,300
Port Neches	2,900	2,200
Raccoon Bend	12,000	11,800
Refugio County	37,400	36,300
Saratoga	1,050	1,000
Somerville	1,700	1,500
Sour Lake	2,350	2,350
South Liberty	5,000	5,500
Spindletop	16,300	17,300
Sugarland	11,950	12,200
West Columbia	6,000	6,100
Others	4,300	4,100
Total, Coastal Texas	184,550	180,500
Increase		4,050

West Central Texas		
Brown County	7,950	8,800
Callahan County	3,700	3,300
Coleman County	4,950	5,500
Eastland-Desdemona	5,600	5,700
Jack 'County	4,400	4,550
Palo Pinto County	750	600
Shackleford County	8,400	8,500
Stephens County	5,850	5,250
Throckmorton County	900	700
Young County	9,350	8,550
Others	1,450	1,300
Total, West Central Texas	53,300	52,750
Increase		550

West Texas		
Crane and Upton Counties	45,000	45,500
Crockett County	2,200	2,200
Howard County	37,500	37,900
Jones County	2,100	2,100
Mitchell and Scurry Counties	2,300	2,400
Reagan County	16,700	16,800
Winkler County	91,000	92,600
Yates	132,500	133,050
Balance Pecos County	6,400	6,500
Others	3,450	3,400
Total, West Texas	339,150	342,450
Decrease		3,300

East Central Texas		
Boggy Creek	3,900	3,500
Corsicana-Powell	6,050	6,000
Currie	350	350
Mexia	4,200	4,300
Nigger Creek	200	200
Richland	250	250
Van Zandt	10,200	9,600
Wortham	900	900
Total, East Central Texas	26,050	25,100
Increase		950

Southwest Texas		
Dale	300	300
Darst Creek	16,000	15,800
Laredo District	8,900	8,850
Luling	10,300	10,400
Lytton Springs	900	900
Salt Flat	24,200	25,200
Somerset	1,400	1,400
Others	2,500	2,600
Total, Southwest Texas	64,500	65,450
Total, Texas (Outside Gulf Coast)	648,500	654,700
Decrease		6,200

Coastal Louisiana		
East Hackberry	1,200	1,350
Old Hackberry	1,200	1,250
Edgerly	550	650
Evangeline	1,100	1,100
Lockport	2,900	3,000
Port Barre	2,200	3,050
Sorrento Dome	100	100
Sulphur Dome	6,000	6,600
Vinton	4,000	4,050
Others	1,550	1,800
Total, Coastal Louisiana	20,800	22,950
Decrease		2,150
Total, Gulf Coast	205,350	203,450
Increase		1,900

ROCKY MOUNTAIN		
Wyoming		
Big Muddy	2,050	2,050
Elk Basin	700	750
Grass Creek	2,050	2,050
Labarge	2,050	2,400
Lance Creek	150	150
Lost Soldier	3,100	3,450
Oregon Basin	3,900	3,900
Rock River	2,250	2,200
Salt Creek	26,250	33,950
Others	2,550	2,750
Total, Wyoming	45,050	53,650
Decrease		8,600
Montana		
Cat Creek	1,250	1,250
Pondera	2,100	2,400
Sunburst	4,950	4,950
Others	50	50
Total, Montana	8,350	8,650
Decrease		300
Colorado		
Florence	550	750
Fort Collins	1,600	1,500
Moffat (Craig)	1,050	1,150
Others	1,450	1,500
Total, Colorado	4,650	4,950
Decrease		300
New Mexico		
Artesia	700	700
Balance Lea and Eddy Counties	7,300	7,450
Hogback	450	400
Rattlesnake	1,150	700
Table Mesa	100	100
Others	950	950
Total, New Mexico	10,650	10,300
Decrease		350
Total, Rocky Mountain	68,700	77,550
Decrease		8,850

CALIFORNIA		
Dominguez	10,000	10,500
Elwood-Goleta	36,800	41,800
Huntington Beach	31,500	41,000
Inglewood	18,200	22,000
Kettleman Hills	13,000	13,000
Long Beach	104,000	111,000
Midway-Sunset	74,500	73,000
Santa Fe Springs	159,000	166,000
Seal Beach	25,800	29,800
Ventura Avenue	44,600	53,900
Others	144,000	161,000
Total, California	661,400	723,000
Decrease		61,600

EASTERN		
(Not including Michigan)	120,000	119,500
Increase		500

MICHIGAN		
Mt. Pleasant	7,800	7,750
Muskegon	5,600	5,600
Saginaw	200	200
Total, Michigan	13,600	13,550
Increase		50

Compilation Of Mid-Continent Refinery Operations

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National Petroleum News

Mid-Continent Refinery Operations Week Ended March 7 (By Telegraph)

	Kansas	Oklahoma	North & Cent. Texas	West Texas	North La.-Ark.	Total Week Ended Mar. 7
Plants Reporting	12	29	25	15	12	93
Da. Av. Cap. (Bbls.)	94,500	161,700	106,100	82,000	77,000	521,300
Da. Cracking Capacity	30,700	52,600	17,200	5,000	22,700	128,200
Da. Av. Crude Runs	63,269 — 0.7	104,783 — 5.2	54,425 — 14.0	43,391 — 9.5	60,219 — 10.3	326,087 — 7.5
Da. Av. Other Oils	8,672 + 11.3	1,438 — 86.6	5,140 + 46.9	1,655 + 9.0	485 — 23.4	17,390 — 28.1
GASOLINE—Gallons						
Stocks, Feb. 28	29,300,000	73,849,000	27,253,000	15,400,000	12,809,000	158,611,000
Prod. 2-28 to 3-7	10,447,000 — 5.5	15,527,000 — 15.3	7,095,000 — 18.2	4,138,000 — 1.9	5,807,000 — 10.4	43,014,000 —11.8
Ship. 2-28 to 3-7	10,832,000 — 1.9	15,374,000 — 8.9	7,681,000 — 17.5	2,854,000 +129.1	6,193,000 — 9.3	42,934,000 — 5.2
Stocks, Mar. 7	28,915,000 — 1.3	74,002,000 + 0.2	26,667,000 — 1.8	16,684,000 + 8.3	12,423,000 — 3.0	158,691,000 +0.05
Ratio Sales to Prod.	103.7%	99.0%	108.3%	69.0%	106.6%	99.8%
KEROSENE—Gallons						
Stocks, Feb. 28	9,512,000	6,944,000	2,642,000	38,000	2,809,000	21,945,000
Prod. 2-28 to 3-7	1,746,000 — 3.7	2,096,000 — 16.6	1,547,000 + 0.9	55,000 + 31.0	431,000 — 50.3	5,875,000 — 13.2
Ship. 2-28 to 3-7	1,941,000 — 8.0	2,216,000 — 24.2	1,685,000 + 1.8	51,000 + 64.5	262,000 — 42.4	6,155,000 — 14.2
Stocks, Mar. 7	9,317,000 — 2.1	6,824,000 — 1.7	2,504,000 — 5.2	42,000 + 10.5	2,978,000 + 6.0	21,665,000 — 1.3
Ratio Sales to Prod.	111.2%	105.7%	108.9%	92.7%	60.8%	104.8%
STOVE DISTILLATE—Gallons						
Stocks, Feb. 28	2,639,000	4,053,000	809,000	213,000	69,000	7,783,000
Prod. 2-28 to 3-7	141,000 — 71.9	717,000 — 18.2	160,000 — 5.9	74,000 — 35.1	129,000 + 9.3	1,221,000 — 31.4
Ship. 2-28 to 3-7	283,000 + 36.1	872,000 — 33.1	165,000 + 34.1	65,000 — 36.3	108,000 — 23.9	1,493,000 — 20.5
Stocks, Mar. 7	2,497,000 — 5.4	3,898,000 — 3.8	804,000 — 0.6	222,000 + 4.2	90,000 + 30.4	7,511,000 — 3.5
Ratio Sales to Prod.	200.7%	123.3%	103.1%	87.8%	83.7%	122.3%
GAS OIL—Gallons						
Stocks, Feb. 28	4,134,000	37,561,000	1,798,000	5,669,000	5,979,000	55,141,000
Prod. 2-28 to 3-7	1,491,000 — 5.1	2,201,000 — 37.8	983,000 +100.6	141,000	2,513,000 + 6.1	7,329,000 — 6.2
Ship. 2-28 to 3-7	1,360,000 + 14.7	1,819,000 +160.6	1,132,000 + 25.5	875,000 + 14.7	2,005,000 + 55.1	7,191,000 + 48.5
Stocks, Mar. 7	4,265,000 + 3.2	37,943,000 + 1.0	1,649,000 — 8.3	4,935,000 — 12.9	6,487,000 + 8.5	55,279,000 + 0.3
Ratio Sales to Prod.	91.2%	82.6%	115.2%	620.6%	79.8%	98.1%
FUEL OIL—Gallons						
Stocks, Feb. 28	11,751,000	29,006,000	67,417,000	13,536,000	25,729,000	147,439,000
Prod. 2-28 to 3-7	5,958,000 + 22.9	5,581,000 — 13.1	6,813,000 — 18.3	6,866,000 — 7.9	5,097,000 — 10.7	30,315,000 — 7.5
Ship. 2-28 to 3-7	4,366,000 + 12.5	5,520,000 — 9.5	7,962,000 — 10.1	6,375,000 + 21.0	4,731,000 — 4.7	28,954,000 — 0.4
Stocks, Mar. 7	13,343,000 + 13.5	29,067,000 + 0.2	66,268,000 — 1.7	14,027,000 + 3.6	26,095,000 + 1.4	148,800,000 + 0.9
Ratio Sales to Prod.	73.3%	98.9%	116.9%	92.8%	92.8%	95.5%

Gasoline Produced by Various Methods, Week Ended March 7

	Kansas	% of Total	Oklahoma	% of Total	North & Cent. Texas	% of Total	West Texas	% of Total	Louisiana-Arkansas	% of Total	Total	% of Total
Straight Run	6,435,000	61.6	10,716,000	69.0	4,998,000	70.4	3,762,000	90.9	2,317,000	39.5	28,228,000	65.6
Cracked	3,028,000	29.0	3,781,000	24.4	1,696,000	23.9	115,000	2.8	2,714,000	46.7	11,334,000	26.3
Natural	984,000	9.4	1,030,000	6.6	401,000	5.7	261,000	6.3	776,000	13.4	3,452,000	8.1
Total	10,447,000		15,527,000		7,095,000		4,138,000		5,807,000		43,014,000	

+ or — columns are % change over previous week.

Mid-Continent Crude Runs Cut 26,700 Barrels Daily

Staff Special—By Telegraph
TULSA, March 10

CRUDE runs at Mid-Continent refineries reporting weekly operations to NATIONAL PETROLEUM NEWS, were reduced 26,700 barrels daily average for the first week of March. Each district shared in the reduction.

Gasoline production was reduced 5,700,000 gallons, the decrease ranging from 1.9 per cent in West Texas to 18.2 per cent in north Texas. Gasoline shipments were lower by 2,300,000 gallons which brought shipments and production for the week almost on a parity. Stocks for the field as a whole were increased only 80,000 gallons. Kansas, north Texas and Louisiana-Arkansas refiners drew on stocks.

Kerosene production and shipments were lower with Kansas, Oklahoma and north Texas drawing on stocks sufficiently to cause draft of 280,000

Summary for the Month

Production and shipments, all reporting refineries, for four weeks ended March. 7. Change in stocks figures from Feb. 7.

	Gallons
GASOLINE	
Production	183,189,000
Shipments	173,735,000
Net changes in stocks	+9,454,000
Ratio sales to production	94.8%
KEROSENE	
Production	24,975,000
Shipments	26,896,000
Net change in stocks	—1,921,000
Ratio sales to production	107.7%
STOVE DISTILLATE	
Production	6,930,000
Shipments	7,206,000
Net change in stocks	—276,000
Ratio sales to production	104.0%
GAS OIL	
Production	28,036,000
Shipments	28,826,000
Net change in stocks	—790,000
Ratio sales to production	102.8%
FUEL OIL	
Production	130,056,000
Shipments	124,367,000
Net change in stocks	+689,000
Ratio sales to production	95.6%

gallons for whole field.

The same districts also drew sufficiently on distillate stocks for a reduction of 270,000 gallons. Gas oil production was slightly lower with shipments considerably higher, but stocks increased 130,000 gallons. Fuel stocks also increased slightly with north Texas only district to draw on storage.

N. Y. Oil Trade Assn. Holds Annual Banquet

NEW YORK, March 10.—Four hundred members of the Oil Trades Association of New York, Inc., and their guests, attended the fourteenth annual banquet held the night of Feb. 27 in the main ball room of the Roosevelt hotel in New York City. The attendance was far greater than that of any previous meeting, according to A. J. Squiers, Warren Lubricants Co., of New York, in charge of this and many of the previous banquets.

The affair was conducted on the plan of those in the past. A dinner of seven courses was served at 8 o'clock although numerous persons arrived an hour or so before and spent their time mingling with friends and associates. A raised dais at one end of the ball room provided a stage for vaudeville artists who presented a creditable performance between courses. Flash light pictures were taken before the first course was served.

Tables were arranged in cabaret style, with a long table for officers of the local association and visiting officials of other associations, placed to one side.

Phillip C. Meon, Borne-Scrymser Co., of New York and president of the New York association, introduced Charles D. Jones, of Charles D. Jones & Co., of Philadelphia, president of the Oil Trades Association of Philadelphia, and J. H. Chambers, of Newark, affiliated with the Richfield Oil Corp., of New York, president of the New Jersey Oil Trades Association.

Speeches were dispensed with although President Meon had the gathering on its toes for a few minutes. Rapping for silence he caught the crowd's attention and introduced "Senator Paxton" of Oklahoma, "who will now deliver an address on the oil tariff."

"Senator Paxton" turned out to be a young vaudeville performer with a remarkable flair for trusting dollar bills to the hands of those nearest the dais. He had more than a passing acquaintance with those bills, too, and in response to the announcement of one of their serial numbers would tell where the bill was minted or vice versa.

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Refinery - Tank Wagon Markets

National Petroleum News

Seaboard Markets Continue Downward; Improvement Noted in Middle West

CLEVELAND, March 11

CONFLICTING price trends were noted for gasolines in various sections of the country last week. Heavy oil prices in practically all districts continued to drift toward lower levels. Lubricating oils held their own fairly well in all markets while wax prices were down 0.125 to 0.25-cent.

Northern sections of both the Atlantic and Pacific seaboards were hot beds of retail gasoline price slashing and tank car markets in these districts quickly reflected the lower retail prices. U. S. Motor at New York harbor dropped to the lowest level prevailing in over five years and California tank car prices for gasoline to be shipped out of the state were off 0.25 to 0.50 cent a gallon.

In direct contrast to the foregoing, spot gasoline buying in the Mid-Continent and Chicago districts was on a larger scale than at any time since the first of the year and prices in these areas showed definite upward tendencies.

Jobbers in the middle west still were able to buy U. S. Motor gasoline at 5.75 cents a gallon on the basis of f.o.b. Group 3. The volume of gasoline offered at this price, however, diminished considerably and, according to reports, the bulk of what still was offered at this figure was material in the hands of resale agents who had purchased some time ago at substantially lower prices.

Domestic burning oils lagged in all important distributing markets. The colder weather which prevailed throughout the middle west last week increased the demand from consumers slightly but distributors for the most part reported they had sufficient oil in storage to take care of this demand and tank car buying was exceptionally light as a result.

The demand from industrial users failed to pick up to any great extent and heavy fuel oils were offered more freely at prices 2.50 to 5 cents per barrel lower.

Spring demand for lubricating oils has been a bit slow in getting under way, according to reports from several territories, but despite this fact very little distress material has put in its appearance. Prices, generally speaking, were unchanged.

An increase of 18,000,000 pounds in wax stocks reported by the Bureau of Mines for January served to further depress wax markets that already were pretty much in the doldrums. Prices for white crude scale on the Atlantic seaboard were off 0.125-cent a pound and field prices, both in Pennsylvania and the Mid-Continent, were off proportionately.

Gasoline Demand Better in Chicago

Staff Special

CHICAGO, March 8

INTEREST of the Chicago trade centered mostly on gasolines in the week ended March 8. Practically all sellers reported a more active demand, both in the open market and for shipments of contract goods, than for some time past. The weather over the middle west, while generally colder than the previous week, was more favorable for motoring and a number of distributors reported enjoying a decided increase in service station sales.

Most sellers reported the bulk of their tank car gasoline sales were for prompt shipment and not over the remainder of March. They reported doing very little business for deferred shipment. One marketer said that an average of three out of five sales, he had made, had been for rush shipment.

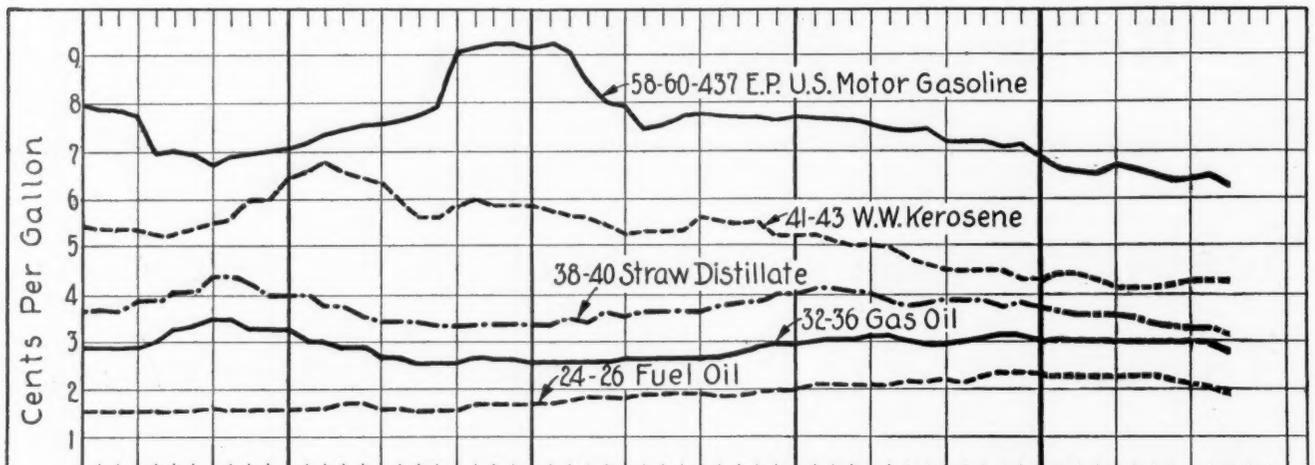
Although the general price range on U. S. Motor gasoline, as shown in the Chicago resale market, was still at 5.75 to 6.50 cents on March 8, there was a decidedly bullish sentiment noticeable in most quarters, especially on Oklahoma and North Texas gasolines. The reported purchase of about 800,000 gallons of U. S. Motor for export shipment from North Texas contributed a good bit toward the optimistic feeling.

Most marketers reported they were unable to buy U. S. Motor in either Oklahoma or North Texas, at under 5.75 cents and had advanced their sales prices to 5.875 or 6 cents. However, several marketers were long some U. S. Motor, which they had purchased at 5.375 and 5.50 cents, and they were still selling at 5.75 cents for prompt shipment. While some of the West Texas refiners advanced their resale prices to 5.75 cents, several Chicago marketers reported they could still buy in this district at 5.625 cents and in one or two spots at 5.50 cents. Goods from this district were still offered to jobbers at 5.75 cents, f.o.b. Group 3.

Gasoline originating at differential territory refineries was not much of a factor in the spot tank car market last week. Reports were that the only U. S. Motor available from these districts at present was that being offered by a few marketers, who had purchased it some time ago. Practically all of this gasoline was reported moved at 5.75 cents, Group 3 basis. It was reported, that an Illinois refinery, which sometime ago moved a large quantity of U. S. Motor on the spot market, had reduced its crude runs considerably and would not be offering any more material on the spot market.

Oklahoma and Chicago district re-

Current Prices of Principal Mid-Continent Refined Products


Cents Per Gallon
58-60-437 E.P. U.S. Motor Gasoline
41-43 W.W. Kerosene
38-40 Straw Distillate
32-36 Gas Oil
24-26 Fuel Oil
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar.
1929
1930

Prices shown are in Group 3 basis and extended to date shown in Refinery Market Tables Section of this issue

finers generally were more optimistic the past week and most of them reported an increase in gasoline sales. Quotations, however, were unchanged, ranging from 6 to 6.50 cents.

Kerosene demand was reported light in the Chicago market last week. Sales prices generally were unchanged over the week, with the bulk of 41-43 w.w. moving at 4.125 to 4.25 cents. A few sales were reported at 4 cents and 4.375 cents.

Most of the Chicago distributors were of the opinion the season for furnace oils was over for this winter and consequently they were unwilling to do much buying. Most of them reported they had enough oil already in storage to last for awhile and they wanted to work this off before making any more purchases. Demand from home burner owners, while somewhat better than the previous week due to the colder weather, was still not very heavy.

Spot tank car prices of distillate, gas and fuel oils reflected the inactive demand and were tending lower. All grades of gas oils were 0.125-cent lower, while fuel oils were off 2.50 to 5 cents per barrel.

Distillates apparently were the easiest of the burning oils and several distributors said they had been shipped 36-38 straw distillate on purchases of straw gas oil. A wide range of prices was reported on the 18-22 zero high sulfur fuel oil. Sales of this grade were reported from $0.675 up to $0.825. Most sales, however, were at $0.725 to $0.80.

Considerable unsettled weather is likely over the Standard of Indiana territory next week, says the Chicago weather bureau. Temperatures will be mostly near the seasonal normal.

Michigan Jobbers to Meet In Detroit Next Week

DETROIT, March 8.—Taxation, legislation and marketing will be subjects for discussion at the annual meeting of the Michigan Oil Men's Association here March 19 to 21 at the Statler hotel.

The list of speakers includes Col. H. T. Klein, chief counsel, The Texas Co.; Frank E. Packard, tax attorney, Standard Oil Co. of Indiana; P. H. Harrison, regional sales manager, Sun Oil Co., Detroit; J. J. Cox, Michigan Oil Co., Ann Arbor; R. E. Chamberlin, general sales manager, Packard Motor Car Co.; and Dr. A. P. Haake, managing director, National Association of Furniture Manufacturers.

Gulf Lubes Remain Steady

HOUSTON, March 10.—Manufacturers report no changes in the Gulf Coastal lubricant situation, which has been steady at increased price levels since early in February. Spot sales are slow, reflecting the season of the year, but increased movement of goods on contracts is reported.

Dr. Frey in New York

NEW YORK—Commodity division chiefs of the Bureau of Foreign and Domestic Commerce, Department of Commerce, will visit the New York office of the department to give them an opportunity of meeting representatives of companies in varied industries. Dr. John Frey, chief of the petroleum section, was available at New York for conferences on Feb. 20.

Prices 10 Years Ago
March 8, 1920

	Oklahoma	Penna.
58-60 U. S. Motor.....	21.25–21.50c	23.50–23.75c
80-84 Natural	22.75–23.00c	.....
Kerosene (41-43 Okla.; 47 w. w. Pa.).....	11.25–11.50c	15.00–15.25c
Fuel Oil (24-26 Okla.; 38-40 Pa.)	$2.60–$2.75	13.00–14.00c
Crude (Okla. 35-35.9)....	$3.50	$6.10
Chicago tank wagon		24.00c

Prices A Year Ago
March 11, 1929

	Oklahoma	Penna.
58-60 U. S. Motor.....	6.9945c	8.75–9.25c
Grade A Natural	6.75–7.00c	.....
Kerosene (Okla. 41-43; Pa., 47 w. w.).....	6.00c	7.75–8.00c
Fuel Oil (Okla. 24-26; Pa. 36-40)	$0.675	5.00–5.25c
Crude (Okla. 35-35.9)....	$1.17	$4.00
Chicago tank wagon		14.00c

Mid-Continent Refinery Markets

Gasoline Improves; Fuel Oils Move Down

Staff Special
TULSA, March 8

A SLOW but steady improvement in the gasoline demand and a continued downward trend in fuel oils characterized the Mid-Continent refinery market the first week of March. Natural gasolines were comparatively steady throughout the week, with only minor fluctuations in prices, and with demand relatively good.

Refiners in all districts reported the demand for gasolines was better than a week ago. Mild weather through much of the Mid-Continent's territory accounted for the increase in the volume of orders. Several refiners reported offers by jobbers to buy at a flat price for delivery over the next 30 to 90 days. One refiner said he had been approached with a 6 cent offer for U. S. Motor over March, April and May, the jobber to pay cash for 100 cars, and to take the oil out as he needed it. The offer, the refiner said, was turned down, and as far as could be checked no other refiner accepted the business on that basis.

Marketers showed more interest in buying for future delivery but refiners showed a reluctance to quote for shipment later than 15 days ahead. Virtually all the low spots had disappeared from the market by the end of the week.

More firmness was given the north Texas domestic market late in the week when an export company bought approximately 800,000 gallons of U. S. Motor gasoline from a central Texas refiner. The price paid was reported to have been around 5.625 cents a gallon, f.o.b. north Texas, although the refiner selling the goods had a slight freight advantage and received more than that for his goods.

Natural gasolines were in better demand several manufacturers reported. Refiners had increased shipping instructions materially since the first of the month and with some buying for export this month and next, prices were comparatively steady all week. Grade BB was the most actively sought commodity and was relatively scarce. Grade AA was sought primarily for shipment to Gulf ports.

Kerosene prices were steady in most districts throughout the week. Demand fluctuated somewhat with the weather but generally speaking it held up well.

Distillates continued to be offered in larger volume and prices moved down fractionally.

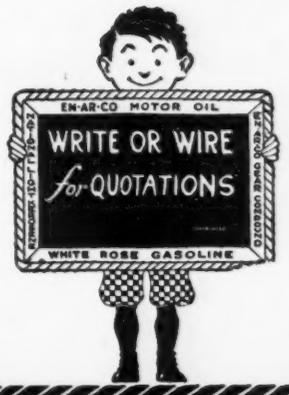
The ordinary grade of 32-36 gravity gas oil was obtainable in Oklahoma before the end of the week at 2.375 cents up, and at approximately the same figure, based on group 3, from other districts. The straw gas oil was not as freely offered, neither were the low cold test oils.

Virtually all grades of fuel oil suffered further price reductions during the week. The reductions were general in the Mid-Continent, with the possible exception of Louisiana and Arkansas, where refiners have the bulk of their production sold on contract to railroads and industrial plants located in their differential territory.

Most of the railroads, incidentally, have made their contracts with refiners for this year. One road was understood to have been somewhat harder to deal with than the others, but that was due in part to the advantageous position in which the road found itself when oil was discovered in Oklahoma City. Some of the producing wells in that field are on the road's right-of-way, and the road's purchasing agents accordingly could be somewhat arbitrary in their dealings with the refiners. The contracts for the most part, however, are on the same basis, with a minimum of $0.75 per barrel and a maximum of $1.05, price based on 60 per cent of the price of 36 gravity Oklahoma crude.

Demand for neutral oils was larger in volume several refiners reported, but prices were unchanged. Bright stock prices also were unchanged, although refiners continued to encounter considerable competition from other districts. One large export company inquired for bright stock recently but did not buy in the Mid-Continent because of the prices quoted. The oil was obtained from Gulf Coast refiners. Virtually all the Mid-Continent refiners making 150-160 vis. D bright stock quoted 37 cents to the domestic jobbing trade. This oil, however, had a pour test considerably under that of the oil sold at 34 cents from plants outside Group 3 but on a Group 3 freight basis.

Wax demand was light and prices were fractionally lower in most quarters the past week.



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NATIONAL PETROLEUM NEWS
700 Penton Bldg.
Cleveland, Ohio

Comparative Prices of 58-60 U. S. Motor Gasoline, 437 E. P., Group 3 and Point of Origin, to Jobbers Only

In Effect March 10

	Price F.O.B. Group 3		*Price F.O.B. Point of Origin*		*If for Particular Destination*
Oklahoma	6.4174	(Wt. Avg.)	6.4174	(Wt. Avg.)	
Kansas	6.25–6.50				S. O. Neb. & Indiana Territory, etc.
Kansas			No sales reported		Kansas only.
North Texas	6.00		5.875–6.00		
West Texas	5.75–6.00		6.00		
Louisiana-Arkansas	5.75–6.25				Michigan, Ohio and Indiana.
Louisiana-Arkansas			6.50		State or differential haul.
Indiana-Illinois	6.00–6.50		*		S. O. Indiana territory except Detroit and vicinity. For Ohio on delivered basis only.

*Shipments made from E. Chicago, Ind., and Wood River, Ill., according to conditions and freight rates; no prices F.O.B. point of origin can be given.

Chicago Resale Market

CHICAGO, March 8

SPOT gasolines were more active in the Chicago market last week. Most carlot marketers were unable to buy U. S. Motor in either North Texas or Oklahoma below 5.75 cents and were quoting 5.875 or 6 cents to jobbers. Several marketers were long some Oklahoma Motor, which they offered at 5.75 cents. Sales of West Texas and differential territory Motor were reported at 5.75 cents, f.o.b. Group 3. Distillate, gas and fuel oils were inactive and prices were lower.

Following prices represent sales made on Group 3 freight basis, although shipments may originate in other refining districts, such as North Texas, West Texas, Arkansas, Louisiana, Illinois, Indiana, Kentucky, etc.

	Prices Mar. 10	**Prices Mar. 3**	**Prices Feb. 24**
58-60 U. S. Motor, 437 e.p.	5.75 – 6.50	5.75 – 6.50	5.75 – 6.50
60-62 437 e.p. gasoline	5.875– 6.50	5.875– 6.50	5.875– 6.50
60-62 400 e.p. gasoline	6.25 – 6.50	6.25 – 6.50	6.25 – 6.50
64-66 375 e.p. gasoline	7.00 – 7.25	7.00 – 7.25	7.00 – 7.50
68-70 350-360 e.p. gasoline	7.50 – 7.75	7.50 – 7.75	7.50 – 8.00
41-43 w.w. kerosene	4.125– 4.25	4.125– 4.25	4.125– 4.25
42-44 w.w. kerosene	4.375– 4.625	4.375– 4.625	4.375– 4.625
38-40 straw distillate	3.125– 3.375	3.125– 3.375	3.25 – 3.50
32-36 ordinary dark gas oil	2.50 – 2.625	2.50 – 2.75	2.50 – 2.75
32-36 dark zero gas oil	2.75 – 3.00	2.875– 3.125	2.875– 3.125
32-36 straw zero gas oil	3.00 – 3.125	3.125– 3.25	3.125– 3.25
28-30 zero fuel oil (per bbl.)	$1.05 –$1.10	$1.075–$1.10	$1.10 –$1.15
28-30 fuel oil (per bbl.)	$1.00 –$1.05	$1.025–$1.05	$1.05 –$1.075
24-26 fuel oil (per bbl.)	$0.825–$0.90	$0.85 –$0.925	$0.925–$1.00
18-22 fuel oil, low sulfur (per bbl.)	$0.75 –$0.775	$0.775–$0.825	$0.775–$0.825
18-22 fuel oil, high sulfur zero (per bbl.)	$0.70 –$0.75	$0.725–$0.80	$0.75 –$0.80

Weighted Average Prices

OKLAHOMA

	Mar. 10		**Mar. 3**		**Feb. 24**	
	No. of cars	**Price**	**No. of cars**	**Price**	**No. of cars**	**Price**
58-60 U. S. Motor, 437 e.p.	56	6.4174	44	6.4715	40	6.4468
60-62 437 e.p. gasoline	No sales reported		3	6.1250	6	6.166
60-62 400 e.p. gasoline	4	6.6250	2	6.7500	2	6.8750
64-66 375 e.p. gasoline	1	7.2500	2	7.5000	1	7.7500
*58-60 437 e.p. gasoline	..	5.875–6.50	..	5.875–6.50	..	5.875–6.50

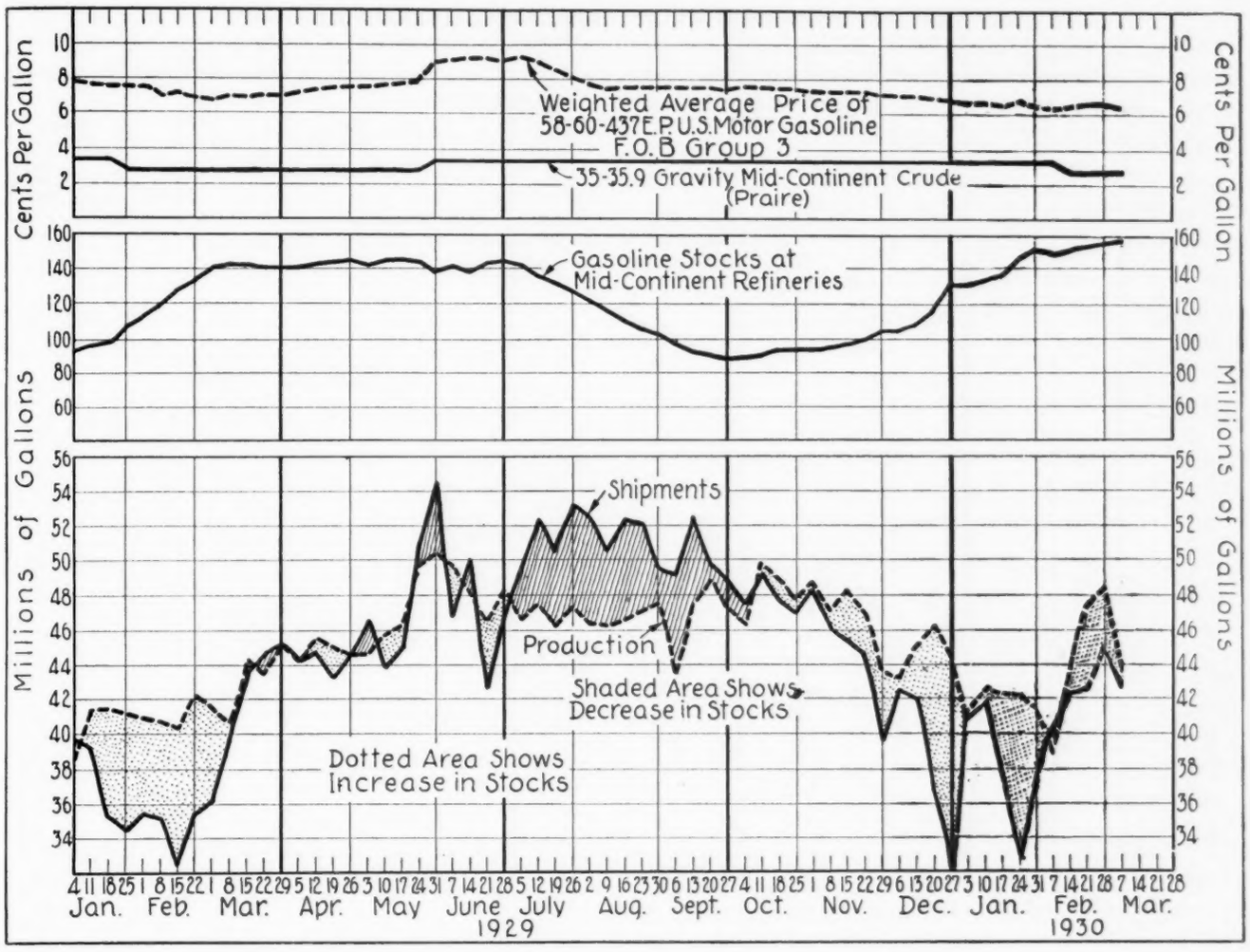
KANSAS

	Mar. 10		**Mar. 3**		**Feb. 24**	
	No. of cars	**Price**	**No. of cars**	**Price**	**No. of Cars**	**Price**
58-60 U. S. Motor, 437 e.p.	No sales reported		No sales reported		1	6.5000

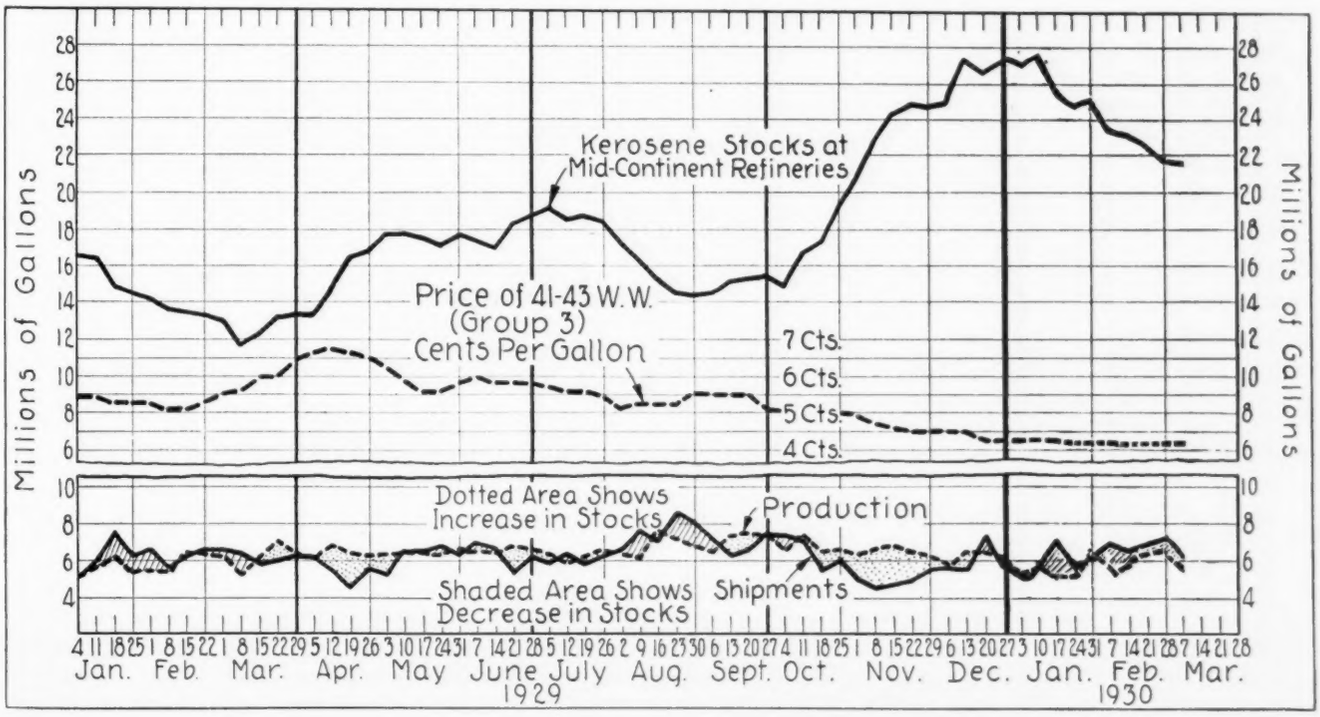
*Full U. S. Motor specifications not guaranteed. Prices represent both quotations and sales.

Barometer of Mid-Continent Refinery Market—Week Ending March 7

Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, From Reports Made by 93 Plants to National Petroleum News


Cents Per Gallon
Weighted Average Price of 58-60-437E.P.U.S.Motor Gasoline F.O.B Group 3
35-35.9 Gravity Mid-Continent Crude (Praire)
Gasoline Stocks at Mid-Continent Refineries
Millions of Gallons
Shipments
Production
Shaded Area Shows Decrease in Stocks
Dotted Area Shows Increase in Stocks
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar.
1929
1930

Prices shown above are extended to date shown in Refinery Market and Crude tables in Market section of this issue and stocks, shipments and Production are extended to date as shown in the table on page 82


Millions of Gallons
Kerosene Stocks at Mid-Continent Refineries
Price of 41-43 W.W. (Group 3) Cents Per Gallon
7 Cts.
6 Cts.
5 Cts.
4 Cts.
Dotted Area Shows Increase in Stocks
Production
Shaded Area Shows Decrease in Stocks
Shipments
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar.
1929
1930

Refinery Markets on Light Oils and Lubricants

Prices given below are in cents per gallon, except where $ is shown

(These Refinery Prices compiled in the OIL PRICE HANDBOOK for a whole year)

GASOLINE AND NAPHTHA

OKLAHOMA (F. o. b. Oklahoma refineries)

	Prices Mar. 10	Prices Mar. 3	Prices Feb. 24
48-50 450 e.p. naphtha...	6.25 – 6.50	6.25 – 6.50	6.25 – 6.50
50-52 450 e.p. naphtha...	6.25 – 6.50	6.25 – 6.50	6.25 – 6.50
56-58 450 e.p. gasoline...	5.75 – 6.25	5.75 – 6.25	5.75 – 6.25
58-60 450 e.p. gasoline...	5.75 – 6.25	5.75 – 6.25	5.75 – 6.25
64-66 390 e.p. gasoline...	7.00 – 7.25	7.00 – 7.25	7.00 – 7.25
68-70 350-360 e.p. gasoline	7.875– 8.25	7.875– 8.25	7.875– 8.25

PENNSYLVANIA (F. o. b. Western Pennsylvania refineries)

52-54 Naphtha.....	7.00 – 7.25	7.00 – 7.25	7.00 – 7.25
54-56 Naphtha.....	7.25 – 7.50	7.25 – 7.50	7.25 – 7.50
58-60 U.S. Motor 437 e.p.	7.25 – 7.75	7.50 – 7.75	7.50 – 7.75
60-62 400-410 e.p. gasoline	7.50 – 8.00	7.625– 8.00	7.75 – 8.125
64-66 390 e.p. gasoline....	8.00 – 8.50	8.00 – 8.50	8.00 – 8.50
68-70 350-360 e.p.....	8.50 – 9.50	8.50 – 9.50	9.00 – 9.50

OHIO (Quotations of S. O. Ohio. 4c state tax to be added.)

U. S. Motor Gasoline

Ohio, delivery at any point.....	9.50	9.50	9.50

KANSAS (F. o. b. refinery Kansas destination)

60-62 437 e.p. gasoline...	6.75 – 7.25	6.75 – 7.25	6.75 – 7.25
60-62 400 e.p. gasoline...	6.75 – 7.50	6.75 – 7.50	6.75 – 7.50
64-66 375 e.p. gasoline...	7.50 – 8 00	7.50 – 8.00	7.50 – 8.00

NORTH TEXAS (F. o. b. North Texas refineries)

56-58 450 e.p. gasoline...	5.75 – 6.00	5.75 – 6.00	5.75 – 6.00
58-60 450 e.p. gasoline...	5.75 – 6.00	5.75 – 6.00	5.75 – 6.00
58-60 U.S. Motor 437 e.p.	5.875–'6.00	5.75 – 6.00	5.75 – 6.00
60-62 400 e.p. gasoline...	6.125– 6.25	6.125– 6.25	6.125– 6.50
64-66 390 e.p. gasoline...	6.75 – 7.00	6.75 – 7.00	6.875– 7.25
64-66 375 e.p. gasoline...	7.50	7.50	7.50 – 7.75
68-70 350-360 e.p. gasoline	7.75	7.75	7.75 – 8.00

****WEST TEXAS** (F. o. b. West Texas refinery, for unrestricted shipment)

50-52 naphtha.....	5.50	5.25	5.25
58-60 437 e.p. gasoline...	5.75	5.75	5.75
58-60 U.S. Motor 437 e.p. gasoline.....	6.00	6.00	6.00

NORTH LOUISIANA (N. La., Ark. and Miss. destination)

58-60 U.S. Motor gasoline	6.50	6.50	6.50

ARKANSAS (Ark., N. La. and Miss. destination)

58-60 U.S. Motor 437 e.p.	6.50	6.50	6.50

CALIFORNIA (3c tax to be added to California gasoline prices if used in state.)

54-58 U.S. Motor 437 e.p.	8.25 – 9.50	8.50 –10.00	8.00 – 9.25
54-58 U.S. Motor, for outside state shipment....	7.00 – 8.00	7.00 – 8.00	6.50 – 7.25
58-61 375-400 e.p. gasoline	9.50 –11.00	9.50 –11.00	9.00 –10.25
42-45 Engine Distillate 445-480 e.p.....	7.25 – 8.50	7.00 – 8.00	7.00 – 7.50

NATURAL GASOLINE

(Note: End point of all grades, not over 375 F. Corrosion test adopted Oct. 1, 1927; A.S.T.M. Method D130-27T; doctor test, July 2, 1928.)

OKLAHOMA (F. o. b. Oklahoma refineries)

Grade AA, 80-87.9, 90% Recovery.....	5.375	5.375– 5.50	5.375– 5.50
Grade A, 72-79.9, 90% Recovery.....	5.50	5.50 – 5.625	5.50 – 5.625
Grade BB, 84-92, 85% Recovery.....	4.375– 4.50	4.375– 4.50	4.50
Grade B, 76-83.9, 85% Recovery.....	4.50	4.50	4.50
Grade C, 80-92, 78% Recovery.....	4.375	4.375– 4.50	4.50

NORTH TEXAS (F. o. b. Breckenridge)

Grade AA, 80-87.9, 90% Recovery.....	5.375	5.375– 5.50	5.375– 5.50
Grade A, 72-79.9, 90% Recovery.....	5.50	5.50 – 5.625	5.50 – 5.625
Grade BB, 84-92, 85% Recovery.....	4.375– 4.50	4.375– 4.50	4.50
Grade B, 76-83.9, 85% Recovery.....	4.50	4.50	4.50
Grade C, 80-92, 78% Recovery.....	4.375	4.375– 4.50	4.50

NORTH LOUISIANA (F. o. b. Monroe District)

	Prices Mar. 10	Prices Mar. 3	Prices Feb. 24
Grade AA.....	†5.50	†5.50	†5.50
Grade BB.....	†4.50	†4.50	†4.50
Grade C.....	†4.375	†4.375	†4.375

CALIFORNIA (F. o. b. California refineries)

75-85, 375-390 e.p. blend	7.75 – 8.00	8.00 – 8.50	8.00 – 8.50

BURNING OILS

PENNSYLVANIA (F. o. b. Western Pennsylvania refineries)

45 w.w. kerosene.....	5.75 – 6.00	5.875– 6.00	5.875– 6.00
46 w.w. kerosene.....	6.00 – 6.25	6.00 – 6.25	6.00 – 6.25
47 w.w. kerosene.....	6.50	6.25 – 6.50	6.25 – 6.50
300 mineral seal.....	6.75 – 7.00	6.75 – 7.00	6.75 – 7.00

OKLAHOMA (F. o. b. Oklahoma refineries)

41-43 w.w. kerosene.....	4.125– 4.375	4.125– 4.375	4.125– 4.375
42-44 w.w. kerosene.....	4.375– 4.50	4.375– 4.50	4.375– 4.50

KANSAS (F. o. b. refinery Kansas destination)

41-43 w.w. kerosene.....	4.75	5.00	4.375– 4.75
42-44 w.w. kerosene.....	5.00 – 5.25	5.00 – 5.25	4.75 – 5.00

NORTH TEXAS (F. o. b. North Texas refineries)

40-42 w.w. kerosene.....	4.00	4.00	3.75 – 4.00
41-43 w.w. kerosene.....	4.125– 4.25	4.125– 4.25	4.00 – 4.125

NORTH LOUISIANA (N. La., Ark. and Miss. destination)

41-43 w.w. kerosene.....	4.75 – 5.00	5.00	5.00
42-44 w.w. kerosene.....	5.00	5.00 – 5.25	5.00 – 5.25

ARKANSAS (Ark., N. La. and Miss. destination)

42-44 w.w. kerosene.....	5.00	5.25	5.25

CALIFORNIA (F. o. b. California refineries)

38-40 w.w. kerosene.....	4.50 – 5.75	4.50 – 5.50	4.00 – 5.00

NEUTRAL OIL

PENNSYLVANIA (F. o. b. Western Pennsylvania refineries)

Vis.		(Viscosity at 70° F.)	
200 No. 3 Assoc. Filt.....	25.00 –26.00	25.00 –26.00	25.00 –26.00
180 No. 3 Assoc. Filt.....	21.00 –22.50	21.00 –22.50	21.00 –22.00
150 No. 3 Assoc. Filt.....	15.50 –17.00	15.75 –17.00	15.75 –17.00
		(Non Viscous)	
34 Grav. 330-340 Flash..	7.00 – 7.50	7.00 – 7.50	7.00 – 7.50

****OKLAHOMA** (F. o. b. Oklahoma refineries)

Vis.	Color	(Viscosity at 100° F.)		
100—No. 2.....		6.00 – 7.50	6.00 – 7.50	6.00 – 7.50
150—No. 3.....		7.75 – 8.50	7.75 – 8.50	7.75 – 8.50
150—No. 4.....		6.75 – 8.00	6.75 – 8.00	6.75 – 8.00
180—No. 3.....		9.00 –10.00	9.00 –10.00	9.00 –10.00
180—No. 4.....		8.75 – 9.50	8.75 – 9.50	8.75 – 9.50
180—No. 5.....		8.50 – 9.00	8.50 – 9.00	8.50 – 9.00
200—No. 3.....		11.00 –12.50	11.00 –12.50	11.00 –12.50
200—No. 4.....		10.00 –11.00	10.00 –11.00	10.00 –11.00
200—No. 5.....		9.50 –11.00	9.50 –11.00	9.50 –11.00
220—No. 3.....		12.50 –13.50	12.50 –13.50	12.50 –13.50
220—No. 4.....		12.00 –12.50	12.00 –12.50	12.00 –12.50
220—No. 5.....		11.00 –12.00	11.00 –12.00	11.00 –12.00
240—No. 3.....		13.00 –15.00	13.00 –15.00	13.00 –15.00
240—No. 4.....		12.00 –13.50	12.00 –13.50	12.00 –13.50
240—No. 5.....		11.00 –13.00	11.00 –13.00	11.00 –13.00
280—No. 3.....		16.00 –17.00	16.00 –17.00	16.00 –17.00
280—No. 4.....		14.00 –16.00	14.00 –16.00	14.00 –16.00
280—No. 5.....		13.00 –15.00	13.00 –15.00	13.00 –15.00

†Prices nominal **††Only one refiner quoting** ***Quotations only** ****Represents Both Sales and Quotations.**

Refinery Markets Wax, Lubricants, Heavy Oil

Prices given below are in cents per gallon, except where $ is shown

(For quick reference to Refinery Prices, get the OIL PRICE HANDBOOK, published annually)

GULF COASTAL (F. o. b. Gulf Coastal refineries)

Vis.	Color	Prices Mar. 10	Prices Mar. 3	Prices Feb. 24
		(Viscosity at 100° F., pour test 0)		
100	No. 2 Pale	6.50 – 7.00	6.50 – 7.00	6.50 – 7.00
200	No. 3 Pale	9.50 – 9.75	9.50 – 9.75	9.50 – 9.75
300	No. 3 Pale	10.75 –11.00	10.75 –11.00	10.75 –11.00
500	No. 3½ Pale	12.00 –12.25	12.00 –12.25	12.00 –12.25
750	No. 4 Pale	13.50 –13.75	13.50 –13.75	13.50 –13.75
1200	No. 5 Pale	16.00 –16.50	16.00 –16.50	16.00 –16.50
200	No. 5½ Red Oil	8.75 – 9.00	8.75 – 9.00	8.75 – 9.00
300	No. 5½ Red Oil	10.00 –10.25	10.00 –10.25	10.00 –10.25
500	No. 6 Red Oil	11.25 –11.50	11.25 –11.50	11.25 –11.50
750	No. 6 Red Oil	12.75 –13.00	12.75 –13.00	12.75 –13.00
1200	No. 5-6 Red Oil	15.00 –15.25	15.00 –15.25	15.00 –15.25

‡CALIFORNIA (F. o. b. California refineries)

Vis.	Color	(Viscosity at 100° F.)		
100	No. 3	9.50 –10.00	9.50 –10.00	9.50 –10.00
200	No. 3	11.50	11.50	11.50
300	No. 3	13.00	13.00	13.00
450	No. 3	15.50	15.50	15.50
550	No. 3	16.50	16.50	16.50
600	No. 3	17.00	17.00	17.00
200	No. 5	11.00	11.00	11.00
300	No. 5	12.00	12.00	12.00
400	No. 5	14.00	14.00	14.00
500	No. 5	15.00	15.00	15.00
600	No. 5	16.00	16.00	16.00
700	No. 7	18.00	18.00	18.00

‡Neutral oils not manufactured commercially in California.

CYLINDER STOCKS

****OKLAHOMA** (F. o. b. Oklahoma refineries)

190-200 Vis. D at 210° Brt. St.	41.00 –42.00	41.00 –42.00	41.00 –42.00
150-160 Vis. D at 210° Brt. St.	37.00	37.00	37.00
150-160 Vis. E 210° Brt. St.	35.00 –36.00	35.00 –36.00	35.00 –36.00
600 St. Ref. Olive Green	9.00 –10.00	9.00 –10.00	9.00 –10.00
600 St. Ref. Dark Green	9.00	9.00	9.00
Black Oil	5.00	5.00	5.00

PENNSYLVANIA (F. o. b. Western Penna. refineries) (A.S.T.M. Tests)

600 Steam Refined, filterable	23.50 –25.00	24.00 –25.00	23.50 –25.00
650 Steam Refined	29.50 –31.00	30.00 –31.00	30.00 –31.00
600 Flash	31.50 –33.00	31.50 –33.00	31.00 –33.00
630 Flash	35.00 –36.50	35.00 –36.50	35.00 –36.00
600 Warren E	30.00 –31.00	30.00 –31.00	29.50 –31.00
600 Oil City E	29.00 –30.00	28.50 –30.00	28.50 –30.00
600 D Filtered	34.50 –35.00	34.50 –35.00	34.50 –35.00
Cold Test Stock, 40-50 p. p., 140-150 vis. at 210° 540-550 flash, No. 8 color	39.50 –41.00	39.50 –41.00	40.00 –41.50
40-50 p.p., 140-150 vis. at 210°, 540-550 flash, No. 6-6½ color diluted	38.00 –39.00	38.50 –39.00	39.00 –40.00

WAX

PENNSYLVANIA (Per pound, F. o. b. New York)

122-124 white crude scale, a.m.p.	2.875– 3.00	3.00	3.00 – 3.125
124-126 white crude scale, a.m.p.	2.90 – 3.00	3.00	3.00 – 3.125

****OKLAHOMA** (Per pound in barrels; in a few instances, per pound in burlap bags; F. o. b. Oklahoma refineries)

124-126 White Crude Scale, a.m.p.	2.625– 2.875	2.75 – 3.125	2.75 – 3.125

CALIFORNIA

Prices on California wax discontinued, as very little is made in California

DISTILLATE, GAS AND FUEL OIL

PENNSYLVANIA (For outside Pittsburgh district)

36-40 fuel oil	4.50 – 4.75	4.50 – 5.00	4.625– 5.00
30-34 fuel oil	4.50 – 4.625	4.50 – 4.75	4.625– 4.75
28-32 fuel oil	4.50 – 4.625	4.50 – 4.75	4.625– 4.75

OKLAHOMA (F. o. b. Oklahoma refineries)

	Prices Mar. 10	Prices Mar. 3	Prices Feb. 24
38-40 straw distillate	3.125– 3.375	3.25 – 3.50	3.25 – 3.50
36-38 straw distillate	3.00 – 3.125	3.00 – 3.25	3.00 – 3.25
32-36 straw gas oil	2.625– 2.875	3.00	3.00
32-36 straw gas oil zero	3.00	3.25	3.25
32-36 dark gas oil	2.375– 2.625	2.50 – 2.75	2.625– 2.75
32-36 dark gas oil zero	2.625– 3.00	2.875– 3.125	2.875– 3.125
28-30 zero fuel oil (per bbl.)	$1.05 – 1.10	$1.05 – 1.10	$1.10 – 1.15
28-30 fuel oil (per bbl.)	$1.00 – 1.05	$1.00 – 1.05	$1.05 – 1.10
26-28 fuel oil (per bbl.)	$0.85 – 0.95	$0.85 – 0.95	$0.90 – 0.975
24-26 fuel oil (per bbl.)	$0.80 – 0.85	$0.825– 0.875	$0.875– 0.925
22-26 fuel oil (per bbl.)	$0.775– 0.825	$0.80 – 0.85	$0.85 – 0.90
18-22 fuel oil (per bbl.)	$0.725– 0.825	$0.725–$0.825	$0.775– 0.875
16-20 fuel oil (per bbl.)	$0.675– 0.725	$0.675– 0.725	$0.70 –$0.75
14-16 fuel oil (per bbl.)	$0.675– 0.725	$0.675–$0.725	$0.70 –$0.75

KANSAS (F. o. b. refinery Kansas destination)

38-40 straw distillate	3.625– 4.00	3.625– 4.00	3.625– 4.00
36-38 straw distillate	3.50 – 3.75	3.50 – 3.75	3.50 – 3.75
32-36 straw gas oil	3.25 – 3.50	3.25 – 3.50	3.25 – 3.50
18-22 fuel oil (per bbl.)	$0.825– 0.875	$0.85 – 0.90	$0.85 – 0.90
10-14 fuel oil (per bbl.)	$0.725– 0.825	$0.825– 0.875	$0.825– 0.875

NORTH TEXAS (F. o. b. North Texas refineries)

38-40 straw distillate	3.00 – 3.25	3.25 – 3.50	3.25 – 3.50
38-40 p.w. treated distillate	3.25	3.50	3.50 – 3.625
32-36 gas oil, cracked	2.50	2.50	2.75
32-36 St. reduced gas oil	2.375– 2.50	2.50 – 2.75	2.50 – 2.75
24-26 fuel oil (per bbl.)	$0.60 – 0.65	$0.60 – 0.70	$0.60 – 0.70
20-24 fuel oil (per bbl.)	$0.575	$0.60	$0.60
18-22 fuel oil (per bbl.)	$0.55	$0.55 –$0.60	$0.55 – 0.60

****WEST TEXAS** (F. o. b. West Texas refinery, for unrestricted shipment)

34-38 gas oil	2.50 – 2.75	2.50 – 2.75	2.50 – 2.75
30-32 gas oil	2.25 – 2.50	2.25 – 2.50	2.25 – 2.50
28-30 zero gas oil	2.50 – 2.875	2.50 – 2.875	2.50 – 2.875
18-22 fuel oil (per bbl.)	$0.60 – 0.80	$0.60 – 0.80	$0.60 – 0.80

NORTH LOUISIANA (N. La., Ark. and Miss. destination)

32-36 gas oil, dark	3.25	3.25 – 3.50	3.50
32-36 gas oil, straw	3.25	3.25	3.25
14-16 fuel oil (per bbl.)	$0.80 – 0.85	$0.80 – 0.85	$0.80 – 0.85

ARKANSAS (Ark., N. La. and Miss. destination)

32-36 gas oil, straw	3.50	3.50	3.50
32-36 dark gas oil	3.25	3.50	3.50
28-30 gas oil	3.25	3.25	3.25
20-24 fuel oil (per bbl.)	$0.95	$0.95	$0.95
9-12 fuel oil (per bbl.)	$0.75	$0.75	$0.75
Black oil	3.25	3.25	3.25

CALIFORNIA (F. o. b. San Joaquin Valley. At San Francisco 4c per bbl. more)

14-18 fuel oil (per bbl.)	$0.45 –$0.55	$0.45 –$0.65	$0.40 –$0.55
14-18 Bunker oil (per bbl.)	$0.70 –$0.75	$0.70 –$0.75	$0.70 –$0.75
30-34 gas oil (per bbl.)	$0.70 –$0.90	$0.70 –$0.90	$0.70 –$0.90
27 Plus Diesel oil (per bbl.)	$0.70 –$0.90	$0.70 –$0.90	$0.70 –$0.90

PETROLATUMS

PENNSYLVANIA (Per pound, in barrels, carload lots, f. o. b. refinery. In tank cars ⅛c to ¾c per pound less.) Two refiners quoting.

Snow White	8.25 – 8.50	8.25 – 8.50	8.25 – 8.50
Lily White	7.25 – 7.50	7.25 – 7.50	7.25 – 7.50
Cream White	6.25 – 6.50	6.25 – 6.50	6.25 – 6.50
Light Amber	3.50 – 3.625	3.50 – 3.625	3.50 – 3.625
Amber	3.25 – 3.375	3.25 – 3.375	3.25 – 3.375
Red	3.00	3.00	3.00

PETROLEUM COKE

****OKLAHOMA** (F. o. b. Oklahoma refineries)

(Per ton in car lots)

Lump	$4.50 – 5.00	$4.50 – 5.00	$4.50 – 5.00
Still run	$3.00	$3.00	$3.00
Breeze	$2.00	$2.00	$2.00

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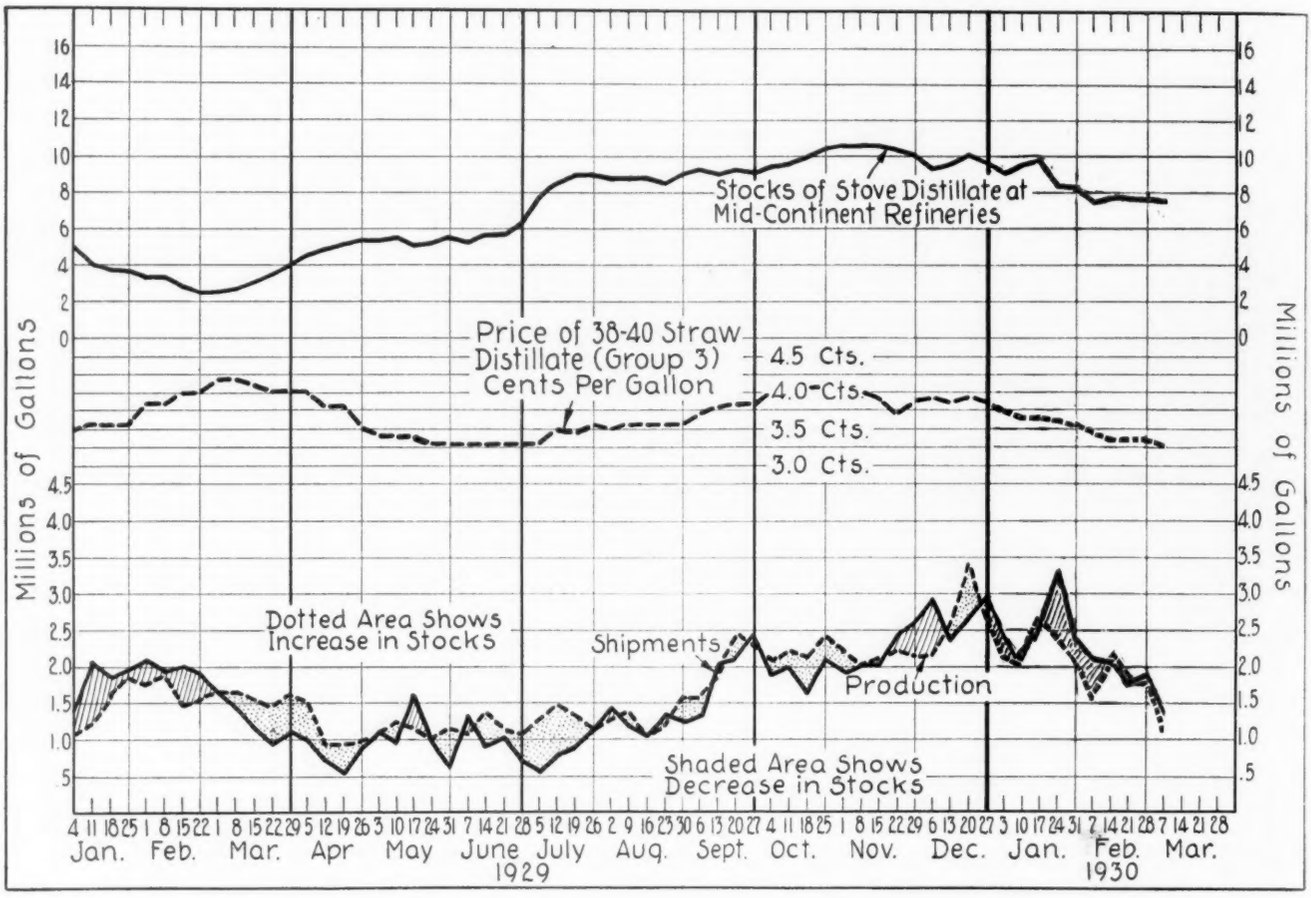
Millions of Gallons
Millions of Gallons
Stocks of Stove Distillate at Mid-Continent Refineries
Price of 38-40 Straw Distillate (Group 3) Cents Per Gallon
4.5 Cts.
4.0 Cts.
3.5 Cts.
3.0 Cts.
Dotted Area Shows Increase in Stocks
Shipments
Production
Shaded Area Shows Decrease in Stocks
Jan. Feb. Mar. Apr May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar.
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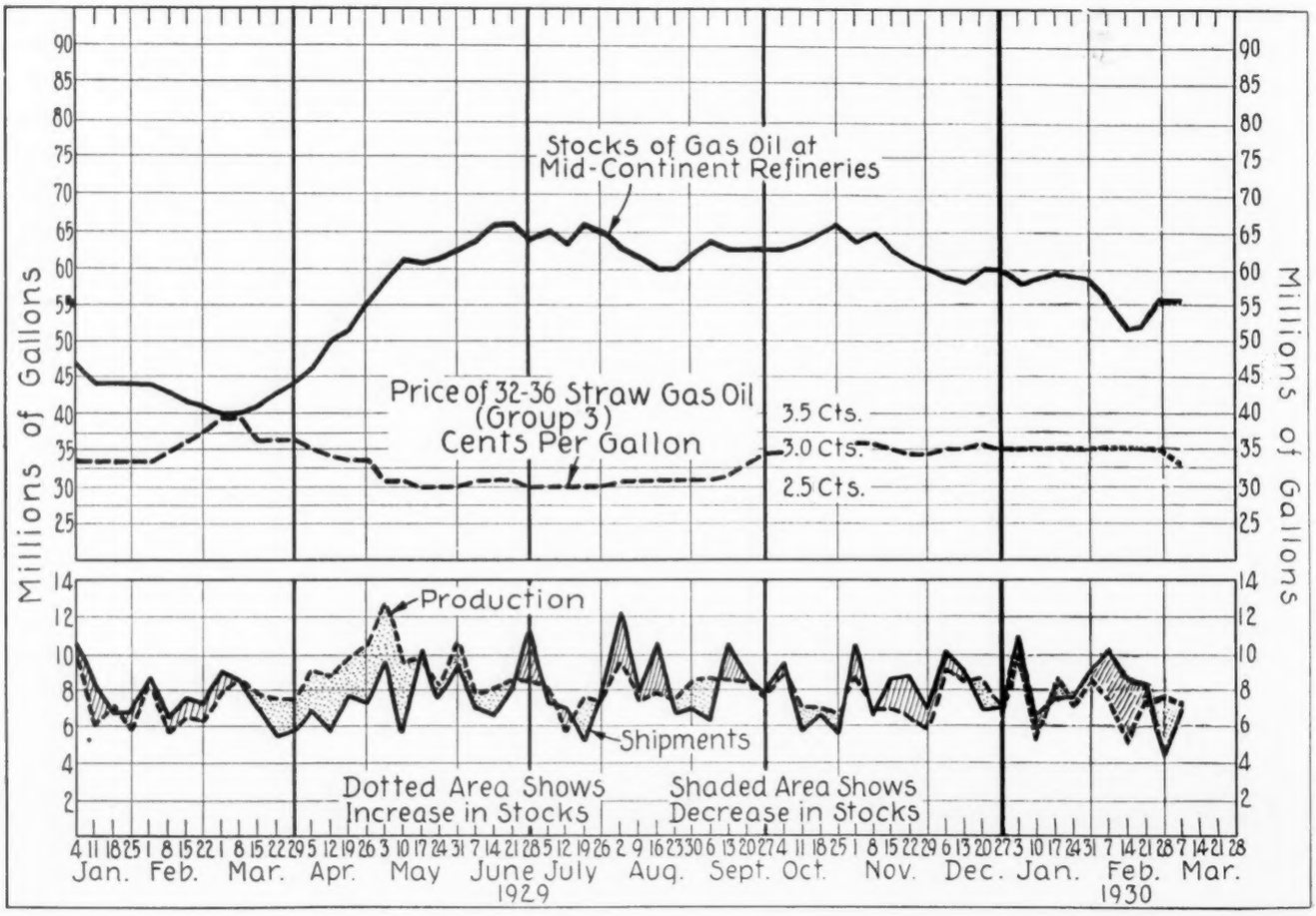
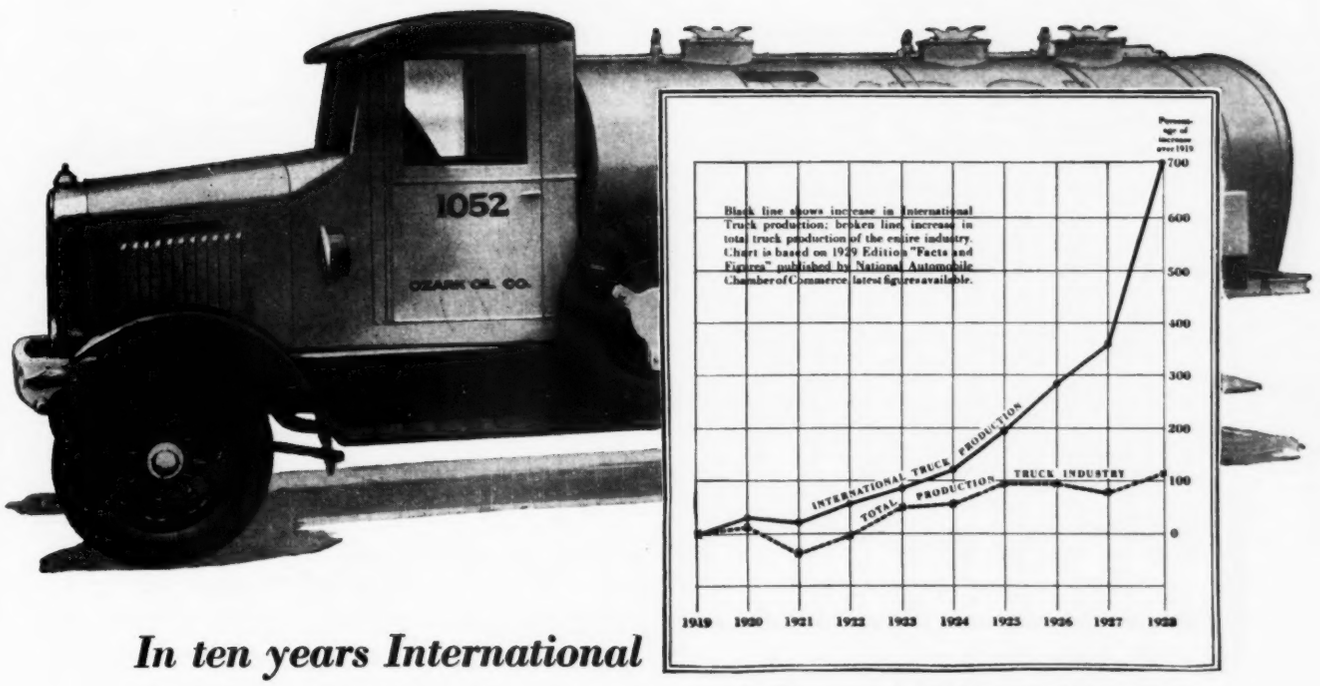
1930


Millions of Gallons
Millions of Gallons
Stocks of Gas Oil at Mid-Continent Refineries
Price of 32-36 Straw Gas Oil (Group 3) Cents Per Gallon
3.5 Cts.
3.0 Cts.
2.5 Cts.
Production
Shipments
Dotted Area Shows Increase in Stocks
Shaded Area Shows Decrease in Stocks
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar.
1929
1930

Fast-Growing Popularity



In ten years International Truck production has increased Seven-Fold, while the total truck production of the industry has only doubled.

Starting in 1919, with a 15-year record of successful truck manufacture, and a production already well up with the leaders, International Truck production has grown seven times as fast as the total output of the industry.

The steadily rising popularity of Internationals can be seen in every form of trucking from New York to Hollywood and on every kind of highway from the pavements of Pensacola to the back-country trails of British Columbia.

Owners of International Trucks representing every type of business, large and small, are firmly convinced that Internationals deliver the very utmost in hauling satisfaction.

This comparison, indicating the growing preference for Internationals, is offered in no vainglorious spirit but simply as a matter of public record.

Please remember, too, that back of International Trucks stands more than a quarter of a century of automotive achievement and 99 years of experience in general engineering and manufacture.

May we add that what Internationals have been doing for others year after year they may rightfully be expected to do for you.

There is an International Truck to meet your particular requirements. We suggest that you ask the nearest International Branch or dealer to show it to you. There is no obligation.

International Trucks include the ¾-ton Special Delivery; the 1-ton Six-Speed Special; Speed Trucks, 1¼, 1½, and 2-ton; and Heavy-Duty Trucks to 5-ton. Company-owned branches at 176 points and dealers everywhere have the line on their display floors for convenient inspection. Catalogs on request.

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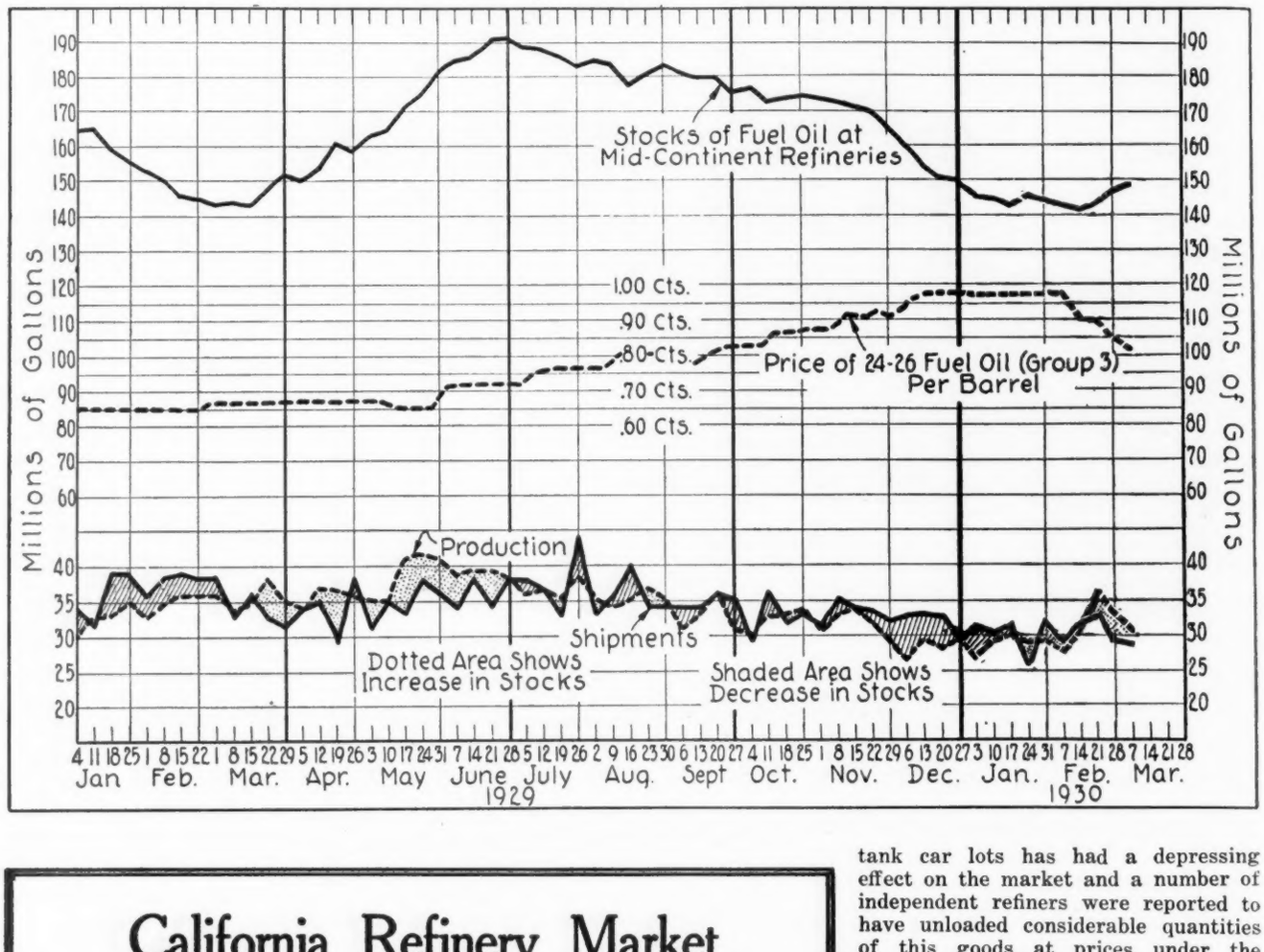
INTERNATIONAL

INTERNATIONAL TRUCKS

Barometer of Mid-Continent Refinery Market—Week Ending March 7

Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, From Reports Made by 93 Plants to National Petroleum News



California Refinery Market

Retail Price Reductions Disturb Market

LOS ANGELES, March 8

LOCAL gasoline markets have been greatly depressed by price cutting activities of large marketing companies recently. A 2-cent reduction in retail tank wagon and service station prices in Oregon and Washington has given rise to the belief on the part of a number of important market observers that general downward revisions along the Pacific Coast are in the offing.

Demand for U. S. Motor gasoline in all divisions of the market continued at low ebb in the week ended March 8. High tanker rates kept eastern cargo buyers out of the market and in view of the shaky position of retail markets, jobbers could be induced to take no more than enough to meet their immediate requirements.

It was reported the past week that Shell Oil Co. has been awarded the Japanese Navy contract calling for delivery of 680,000 barrels of 19 gravity fuel oil between April 1 and Oct. 1, 1930, at a price of $0.54 per barrel f.o.b. vessel.

Although a few inquiries were reported for U. S. Motor gasoline from eastern buyers there was little indication that any deals would be closed until existing high charter rates on clean tankers are reduced. Quotations on all export petroleum products remained unchanged from those posted for the week ended March 1.

Tank car gasoline quotations dropped 0.25 to 0.50 cent for shipment within the state and several refiners predicted an additional cut during the early part of next week. Gasoline moved to points within the state generally at from 8.25 to 9.50 cents with some sales being reported made as low as 8 cents, state tax additional.

Gasoline to be consumed outside the state could be bought at a shade under 6.50 cents although the posted quotations ranged from 7 to 8 cents.

A decreasing demand for fuel oil in tank car lots has had a depressing effect on the market and a number of independent refiners were reported to have unloaded considerable quantities of this goods at prices under the posted quotations of $0.45 to $0.55 per barrel.

Kerosene-distillate, 38-40 gravity, was reported available at about 2 cents per gallon as compared with a price of 3.75 cents quoted a year ago.

Prices on other refinery products were unchanged during the past week as California marketers, jobbers and dealers hesitated to increase their refined oil stocks while the market was in its present condition of unrest.

Marking the first break in the front major companies have presented to the price-cutting campaign waged by various independents since the "gas-war" of last summer. Seven dealers handling Standard Oil Co. products in Los Angeles reduced their service station price from 19.50 cents to 16.50 cents per gallon on March 6. The price was later restored to its former level but an increasing number of stations selling "bootleg" gasoline at prices ranging from 14 to 17.50 cents is expected to precipitate a crisis in western retail markets.

Pennsylvania Market

U. S. Motor Quoted Lower

CLEVELAND, March 10.—Jobbing demand for the most part continued extremely light in western Pennsylvania refinery markets during the week ended March 8. On one or two occasions a few refiners asserted they were enjoying a fairly good demand for a commodity or two, but generally speaking, buying was practically at a standstill.

Gasoline and kerosene were hit rather hard by adverse weather conditions which prevailed throughout the middle west. Hesitancy on the part of buyers about preparing for their spring requirements of lubricating oils caused stocks of some grades to pile up at plants and this had a tendency to further depress prices for these oils.

U. S. Motor gasoline worked a 0.25-cent lower on the low of the market price range. This grade was offered rather freely at 7.25 cents in some districts at the end of the week. A number of refiners continued to quote and report sales of U. S. Motor at 7.50 cents and some were asking 7.75 cents.

During the early part of the week, several of the trade were inclined to think there had been a slight improvement in the kerosene market. Sellers said they were having less difficulty in getting 6 cents for 45 w.w. and sales were reported at as high as 6.25 cents. Nevertheless, the aforementioned grade was easier toward the end of the week with a fairly large volume of material being offered as low as 5.75 cents in one district. Resale agents reported they had run into competition at still lower prices.

A refiner on March 4 reported selling 500,000 gallons of fuel oil to one buyer and also asserted he had taken orders for approximately 25 cars additional from smaller buyers. According to reports from a majority of the trade, however, this refiner's position on fuel oil was the exception rather than the rule.

Steam refined cylinder stocks held up remarkably well in face of the lower prices for bright stock. Good filterable 600 stock was rather tightly held with very little available under 24 cents a gallon.

A few distress sales of No. 8 color bright stock were reported at less than 39.50 cents but this figure was the low of the general market. Some manufacturers quoted up to 42 cents a gallon but asserted they had booked very few orders.

Sales of 122-124 white crude scale were reported at 2.875 cents a pound, New York, an 0.125-cent off from quotations of the previous week. The higher melting point grade, 124-126, sold 0.10-cent lower at 2.90 cents a pound.

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NEW YORK—342 Madison Avenue
CLEVELAND—1213 West Third St.

Eastern Domestic Markets

Gasoline Prices Down in All Districts

Staff Special
NEW YORK March 8

SLACK demand and lower tank wagon prices caused downward revisions of tank car gasoline prices of 0.25 cent to 1 cent in the majority of eastern markets the past week. These reductions applied both to regular U. S. Motor and California gasoline. Kerosene prices in two principal seaboard markets also were lower.

Spot demand for gasoline has been virtually at a standstill, the majority of suppliers at all points on the seaboard reported. It was more pronounced in northern sections although orders dropped off in southern districts too. New England refiners reported that virtually all gasoline sold in their territory was moving against contracts and that jobbers were interested in covering on their future requirements only through this means.

The same was true at New York, Philadelphia and Baltimore. In more southern districts good weather has served to bring a few spot customers into the market, but these were greatly in the minority, the trade reported.

The cessation of spot business, the trade reported, has been the direct outgrowth of recent reductions in tank wagon prices, resulting in lower-priced shipments of contract gasoline which have had the tank wagon market as their base. Spot tank car prices have followed, dropping from 0.25 cent to 1 cent in some districts; sellers have had to compete with the lower priced tank wagon deliveries or lose business.

The market opened March 3 with spot tank car prices in the New York harbor district at 8 to 8.50 cents. These prices were being shaded in one or two directions but the bulk of this movement was in barges in greater quantities than the usual tank car shipment. Sales at the lower prices spread toward the middle of the week to include tank car shipments into upper New York state and into New Jersey with the result that most sellers lowered their prices to 8 cents flat. On March 8 several refiners reported they were losing business at 8 cents and lowered their prices to 7.75 cents.

Gasoline prices at Providence, Boston and Portland dropped 1 cent a gallon March 7 following Standard's tank wagon reduction of the day before. Spot buyers in the Portland district were quoted 9.30 cents delivered. Prices at Boston and Providence were 9 cents delivered. One company which previously had quoted a higher price for shipments outside the immediate Boston district adopted the 9-cent price for the entire district. Another seller continued to quote 10 cents in Massachusetts and Rhode Island and 10.50 cents in Maine. One large refiner in the Boston district estimated that 95% of the gasoline shipped was moving on contracts.

At all points south of New York harbor the general market for U. S. Motor was 8.25 to 8.50 cents. The reduction to this level in all cases with the exception of Philadelphia were made March 8. One supplier in the southern districts was considering lowering his price March 8, and several of the trade said they expected to see a general downward price revision this week.

California gasoline prices were 0.25 cent lower at New York and Baltimore, in line with the 8.50 cent quotation at Philadelphia. Several of the trade expected these prices to hold in view of the high transportation costs from California to the east coast. It was reported this week by a well informed market observer that a cargo of California gasoline had been delivered to the east coast at 7 cents. The sale was not believed representative of the general market, however.

Those associated with the boat market are of the opinion there will be no reduction in clean rates in the near future despite the fact that there has been very little demand for charters from independent companies. It was reported that from six to 10 clean ships had been taken from the intercoastal market and placed in trans-Atlantic service which will tend to keep local rates high. These boats were said to have been owned by four large eastern refiners.

Kerosene markets at all points have been affected by warmer weather and lower tank wagon prices. Kerosene was available in New York harbor at 7.25 cents and in Philadelphia and Baltimore at 7.50 cents. A large eastern refiner this week reported being offered 100 cars of Pennsylvania 45 water white kerosene at 5.75 cents for shipment over March.

Gulf Coast Markets

Demand Quiet Following Price Reductions

Staff Special
NEW YORK, March 8

GULF markets settled down to pretty much of a routine affair last week following the price reductions made for gasoline and kerosene the week before by the Export Petroleum Assn. There were no inquiries from foreign buyers and no spot shipments consigned abroad left the Gulf, as far as could be learned. Prices for all commodities were unchanged although some of the trade believed domestic quotations might be shaded with firm offers.

There was considerable discussion of prices for heavy oils for shipment from the Gulf. Some of the trade were inclined to believe that 3.875 cents might be shaded for 26-30 translucent gas oil, if the buyer were to go into the market with a firm offer. For prompt shipment 3.75 cents might be done they said. On the other hand several of the trade reported that, inasmuch as the majority of gas oil was being used for cracking stock there was no great surplus and present prices could not be bettered.

The market for Bunker C fuel oil was reported in a better position than it has been for some weeks. According to the trade there was little if any Bunker C available under $0.68 per barrel and some refiners were unwilling to commit themselves for future deliveries at that price. A domestic seller who was reported to have offered some surplus oil for export shipment in order to get rid of it, was said to be sold up and out of the market.

One eastern refiner with connections at the Gulf said that less than 7 cents might be done for coastwise shipment of U. S. Motor, but he had no actual inquiry or transaction in mind on which to base his opinion. On the other hand other sellers were inclined to believe that gasoline and kerosene were not available at lower prices due to the approach of warmer weather.

The opinion was expressed in some quarters that there might be another change in export prices for gasoline and kerosene within the next few weeks. This change probably would be upward. Also, some of the trade have asserted, the reduction was primarily a temporary measure to ward off the influx of orders which were coming into the Mid-Continent and which bid low prices.

Wax Markets

Spot Buying Continues Light

NEW YORK, March 8.—Wax markets continued along their uninteresting trend of the past few weeks and were without outstanding features in the week ended March 8. White crude scale toward the end of the week was offered at lower prices at New York but was unchanged at the Gulf. Fully refined waxes were unchanged in both markets.

Foreign buyers showed very little interest in the market although one or two sales of small lots were reported toward the end of the week. These sales covered white crude scale for shipment to the United Kingdom, and were made at 2.875 cents and 2.90 cents, f.a.s. New York harbor.

Domestic consumers showed less interest in the market than a week ago and some of the trade believed it was largely due to the inactivity of United States buyers that prices declined.

New York refiners and dealers expressed various opinions as to the future of the market although the majority could see no betterment in the immediate future. The increase of approximately 18,000,000 pounds in wax stocks as reported by the Bureau of Mines for January, will have a tendency to keep buyers out of the market with the exception of those who must have material for their immediate needs, some of the trade believed. On the other hand some sellers believed prices are on bottom and no better time for buying will be found in the coming weeks.

The low price for white crude scale prices, 2.875 cents, could be done only for immediate shipment, some of the trade reported. Others believed that price might be shaded with a firm offer on a sizable quantity. One source reported two Pennsylvania refiners were long on stocks and indicated they would sell at "an attractive figure" to relieve their storage.

It was generally believed that the increase in stocks was largely made up of crude scale waxes although more fully refined wax has been going into storage. The movement of the latter class of waxes against contracts has been good, the majority of the trade said, which has kept storage down and prices at fair levels.

Wax production is expected to increase through the warmer months as the result of increased output of motor oils.

Peru imported 6,400,000 pounds of paraffin wax in 1928, 4,160.000 pounds of which came from the United States, and 2,033,000 pounds from Great Britain.

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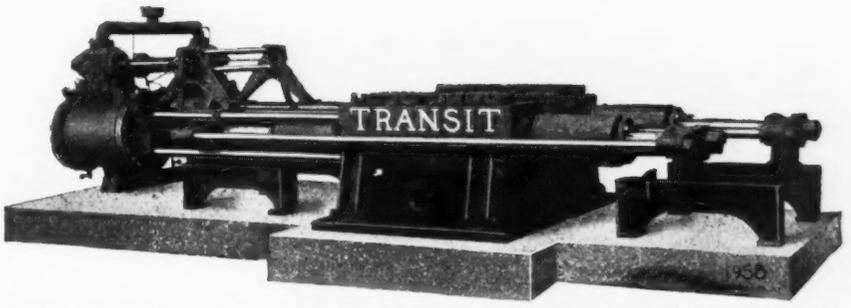

Right now we have the engineering talent and manufacturing facilities available to give you the best of service, and you will get your pumping equipment in plenty of time for installation before the Spring rush of the refining business.

Last Winter we worked day and night to keep up with the orders for TRANSIT Hot Oil PUMPS, but even then some good refiners had to content themselves with other makes of hot oil pumps.

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TO refinery officials, the fact that Oliver United makes many types of filters is important.

It means that whenever a new application of filtration is developed, the choice of filter may be from many instead of just one or two.

This assures better suitability. So come to Oliver United with your filtration project.

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Complete Seaboard Market

(Export Markets for whole year given in OIL PRICE HANDBOOK. Each volume carries refinery, tank wagon, crude and export markets—complete for the whole year)

Eastern Domestic Market

(Prices for tank car lots, f. o. b. refinery or seaboard terminal, representing majority of quotations.)

U. S. MOTOR GASOLINE	Mar. 10	Mar. 3	Feb. 24
New York harbor	7.75 – 8.00	8.00 – 8.50	8.25 – 8.50
Portland district	*9.30	**10.30–10.50	**10.30–10.50
Boston district	*9.00	*10.00	*10.00
Providence district	*9.00	*10.00	*10.00
Philadelphia district	8.25 – 8.50	8.25 – 8.50	8.50
Baltimore district	8.25 – 8.50	8.50	8.50
Norfolk district	8.25 – 8.50	8.50	8.50
Charleston district	8.25 – 8.50	8.50	8.50
Savannah district	8.25 – 8.50	8.50	8.50
Jacksonville district	8.25 – 8.50	8.50	8.50
CALIFORNIA, U. S. MOTOR GASOLINE			
New York harbor	8.50	8.50 – 8.75	8.50 – 8.75
Philadelphia district	8.50	8.50	8.50
Baltimore district	8.50	8.50 – 8.75	8.50 – 8.75
WATER WHITE KEROSENE			
New York harbor	7.25 – 7.75	7.50 – 7.75	7.625– 7.75
Philadelphia district	7.50 – 7.75	7.50 – 7.75	7.75
Baltimore district	7.50 – 7.75	7.75	7.75
GAS OIL: 28-34 Gravity			
New York harbor	4.75 – 5.25	4.75 – 5.25	4.75 – 5.25
Boston district	4.75 – 5.25	4.75 – 5.25	4.75 – 5.25
FURNACE OIL: 36-40 Gravity			
New York harbor	6.00 – 6.25	6.00 – 6.25	6.00 – 6.25
Boston district	6.00 – 6.25	6.00 – 6.25	6.00 – 6.25
GRADE C BUNKER OIL†			
New York Harbor	$1.05	$1.05	$1.05
Boston district	$1.05	$1.05	$1.05
DIESEL OIL			
New York harbor	$2.00 –$2.10	$2.00 –$2.10	$2.00 –$2.10

Note: Above gasoline prices do not include inspection tax levied in some states.
*Minimum delivered. †Lighterage 5c per bbl. additional. **Delivered prices.

New York Export Market

(Lubricating oils are per gal. in bbls. F.a.s. New York)

	Mar. 10	Mar. 3	Feb. 24
CYLINDER OILS (Pennsylvania Products)			
Bright stock, dark	45.50 –47.00	46.00 –48.00	46.50 –50.00
600 D filtered	38.75 –40.00	38.50 –40.00	39.75 –42.00
600 Warren E filtered	35.00 –37.00	35.00 –37.00	35.00 –37.00
600 s.r. unfiltered	29.50 –31.00	27.50 –30.00	30.00 –31.00
650 s.r. unfiltered	36.00 –37.00	36.00 –37.00	36.00 –37.00
600 flash, s.r.	38.00 –40.00	37.50 –40.00	38.50 –40.00
630 flash, s.r.	43.00 –44.00	42.50 –44.00	42.50 –44.00
RED ENGINE OILS (Vis. 100°)			
300 vis. No. 6½ color	20.00 –21.00	20.00 –21.00	20.00 –21.00
250 vis. No. 6 color	17.50 –18.50	17.50 –18.50	17.50 –18.50
200 vis. No. 6 color	16.50 –17.50	16.50 –17.50	16.50 –17.50
PALE ENGINE OILS (Vis. 100°)			
230 vis. No. 3¾ color	23.00 –24.00	23.00 –24.00	23.00 –24.00
180 vis. No. 3¼ color	19.00	19.00	19.00
100 vis. No. 2¼ color	15.50 –16.00	15.50 –16.00	15.50 –16.00
MOTOR OILS (Vis. 100°)			
600 vis. No. 7 color	30.00	30.00	30.00
500 vis. No. 6½ color	26.50 –27.50	26.50 –27.50	26.50 –27.50
400 vis. No. 7¼ color	23.00 –25.00	23.00 –25.00	23.00 –25.00
300 vis. No. 6 color	20.00 –22.00	20.00 –22.00	20.00 –22.00
200 vis. No. 6 color	18.00 –20.00	18.00 –20.00	18.00 –20.00

Wax Markets

(Prices in cents per pound, A.S.T.M. tests; A.M.P.)

NEW YORK (F.a.s. carload lots)

	Mar. 10	Mar. 3	Feb. 24
124-126 Yellow crude scale	2.875– 3.00	2.875– 3.00	2.875– 3.00
122-124 White crude scale	2.875– 3.00	3.00	3.00
124-126 White crude scale	2.875– 3.00	3.00	3.00
123-125 Fully refined	4.00 – 4.125	4.00 – 4.125	4.00 – 4.125
125-127 Fully refined	4.00 – 4.25	4.00 – 4.25	4.00 – 4.25
128-130 Fully refined	4.25 – 4.50	4.25 – 4.50	4.25 – 4.50
130-132 Fully refined	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75
133-135 Fully refined	5.50 – 5.75	5.50 – 5.75	5.625– 5.75
135-137 Fully refined	5.75 – 6.00	5.75 – 6.00	5.75 – 6.00
NEW ORLEANS (F.a.s. carload lots)			
124-126 Yellow crude scale	2.875	2.875	2.875
122-124 White crude scale	2.875– 3.00	2.875– 3.00	3.00
124-126 White crude scale	2.875– 3.00	2.875– 3.00	3.00
123-125 Fully refined	3.875– 4.00	3.875– 4.00	3.875– 4.00
125-127 Fully refined	4.00	4.00	4.00
128-130 Fully refined	4.125	4.125	4.125
130-132 Fully refined	4.375	4.375	4.375
133-135 Fully refined	5.50	5.50	5.50

Gulf Export Market

(Prices are f. o. b. Gulf oil terminals in Texas and Louisiana, shipments of 20,000 bbls. or more unless otherwise noted and for export shipment only).

GASOLINE	Mar. 10	Mar. 3	Feb. 24
U. S. Motor	8.00	8.00	8.50
60-62, 400 e.p.	9.00	9.00	9.50
61-63, 390 e.p.	9.25	9.25	9.75
64-66, 375 e.p.	9.50	9.50	10.00
U. S. Motor, cases (cargoes)	$1.85	$1.85	$1.85
64-66, cases (cargoes)	$2.05	$2.05	$2.05

KEROSENE	Prices Mar. 10	Prices Mar. 3	Prices Feb. 24
44 water white	7.00	7.00	8.00
41-43 prime white	6.00	6.00	7.00
Water white, cases (cargoes)	$1.85	$1.85	$1.85
Prime white, cases (cargoes)	$1.75	$1.75	$1.75
DOMESTIC GAS & BUNKER OILS			
*26-30 translucent gas oil	3.875– 4.00	3.875– 4.00	3.875– 4.00
*30 plus translucent gas oil	4.00 – 4.25	4.00 – 4.25	4.00 – 4.25
Grade C bunker oil	$0.95	$0.95	$0.95
Grade C bunker oil, cargoes	$0.68 –$0.70	$0.68 –$0.70	$0.68 –$0.70

*Less than ½ of 1% sulphur.

MEXICAN CRUDE AND BUNKER OILS (F. O. B. Steamer, Tampico)			
Heavy Panuco crude taxes to be paid	$0.70 –$0.75	$0.70 –$0.75	$0.70 –$0.75
Grade C bunker oil for bunkering purposes, taxes paid	$1.00	$1.00	$1.00

SOUTH TEXAS LUBRICATING OILS (Viscosity at 100°F. cold test 0. Tanker, f. o. b. Houston)

100 vis. No. 2 unfiltered pale	5.75 – 6.00	5.75 – 6.00	6.00
200 vis. No. 3 unfiltered pale	8.00 – 8.50	8.00 – 8.50	8.50
300 vis. No. 3 unfiltered pale	8.875– 9.50	8.875– 9.50	9.50
500 vis. No. 3½ unfiltered pale	10.25 –11.25	10.25 –11.25	11.25
750 vis. No. 4 unfiltered pale	12.50 –12.75	12.50 –12.75	12.50 –12.75
1200 vis. No. 5 unfiltered pale	16.00 –18.00	16.00 –18.00	16.00
200 vis. No. 5-6 red oil	7.00 – 7.25	7.00 – 7.25	7.25
300 vis. No. 5-6 red oil	8.375– 8.50	8.375– 8.50	8.50
500 vis. No. 5-6 red oil	9.25 – 9.50	9.25 – 9.50	9.50
750 vis. No. 5-6 red oil	11.50	11.50	11.50
1200 vis. No. 5-6 red oil	15.00 –15.25	15.00 –15.25	15.00

Gulf Domestic Market

(Prices are f.o.b. Gulf oil terminals in Texas and Louisiana in shipments of 20,000 bbls. or more, representing sellers' opinions, for domestic shipment only).

	Mar. 10	Mar. 3	Feb. 24
U. S. Motor gasoline	7.00 – 7.125	7.00 – 7.125	7.00 – 7.125
41-43 w.w. kerosene	5.875– 6.25	5.875– 6.25	5.875– 6.25
*26-32 translucent gas oil	3.875– 4.125	3.875– 4.125	3.875– 4.125

*Less than ½ of 1% sulphur.

†Pacific Export Market

(Quotations are at seaboard, Los Angeles, in cargo lots, cents per gallon, except where otherwise noted.)

	Mar. 10	Mar. 3	Feb. 24
Gasoline, U. S. Motor, 53-55 Gravity	6.25 – 7.00	6.25 – 7.00	6.00 – 7.00
Gasoline, U. S. Motor-blends and special cuts	7.25 –10.00	7.25 –10.00	7.25 –10.00
Gas Oil, 30-34, per barrel	$0.80 –$1.05	$0.80 –$1.05	$0.80 –$1.00
Diesel Oil, 27 plus, per barrel	$0.75 –$1.00	$0.75 –$1.00	$0.75 –$1.00
Bunker oil, 14-18, per barrel	$0.65 –$0.85	$0.65 –$0.85	$0.65 –$0.85
Fuel oil, 14-18 per barrel	$0.60 –$0.85	$0.60 –$0.85	$0.60 –$0.85
Kerosene, 38-40 w.w., 125-150 flash, per gal.	5.00 – 6.00	5.00 – 6.00	5.00 – 6.00
Cased Goods			
Gasoline, U. S. Motor	$1.75 –$1.85	$1.75 –$1.85	$1.75 –$1.85
Kerosene, 38-40 w.w., 125, 150 flash	$1.45 –$1.50	$1.45 –$1.50	$1.45 –$1.50

†**Note:** Above Pacific Export market prices for gasoline and kerosene in cargo lots apply only on goods for coastwise shipment. Gasoline and kerosene prices for shipment to foreign ports are determined as follows: Difference in freight between U. S. Gulf to European Continent and California to European Continent—this difference plus 0.125c for handling, deducted from prices posted at U. S. Gulf by the Export Petroleum Assoc., Inc., which are above prices.

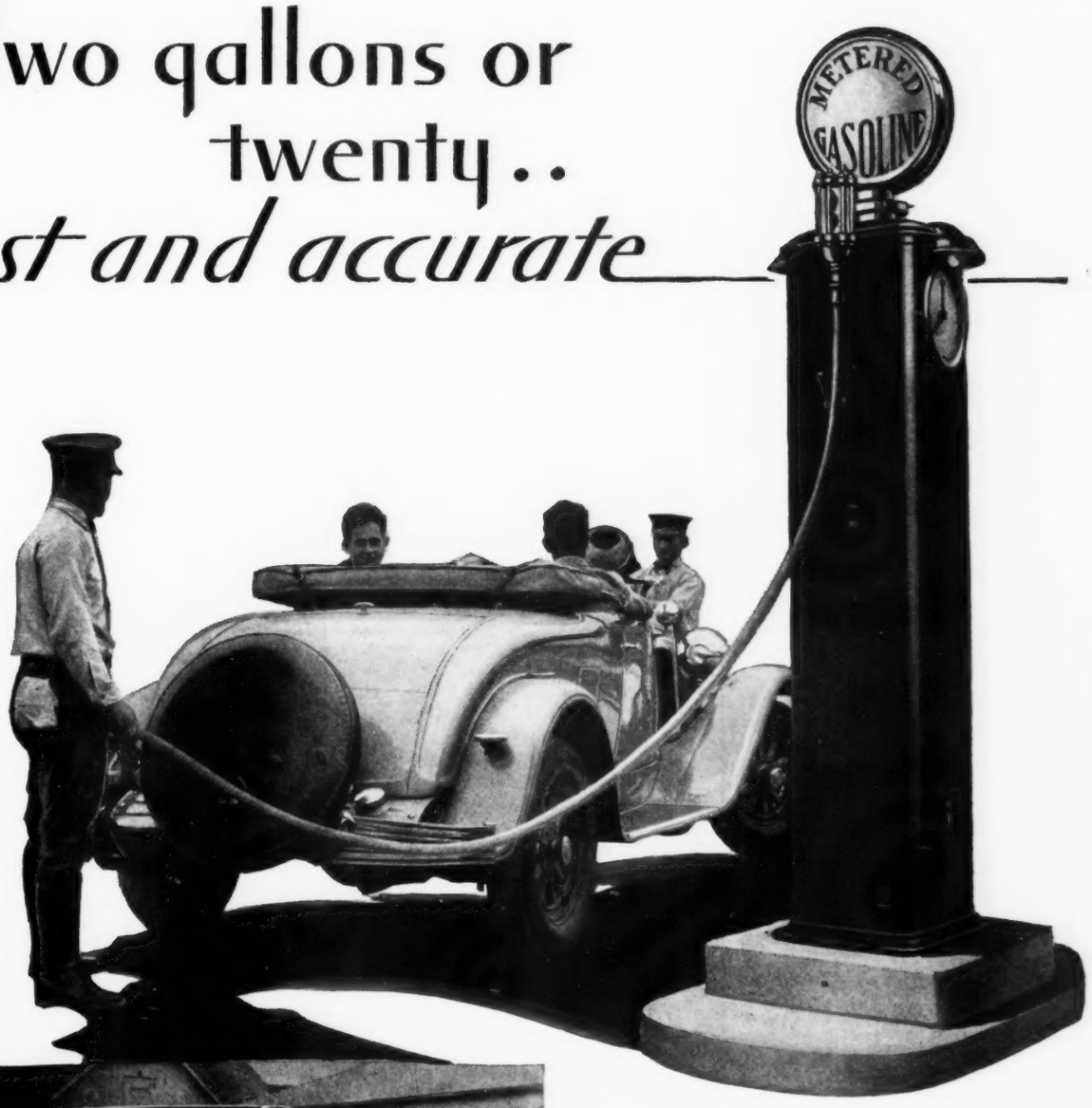
Tanker Rates

(Approximate tanker freight rates to Continental ports, in shillings per ton of 2240 pounds, British sterling; to American ports, cents per barrel.)

	Mar. 10 Crude &/or Fuel	Mar. 10 Refined Oil &/or Spirits
Calif. to U. K. or Continental ports*	40	55
Gulf to U. K. or Continental ports*	26-28	42/6
North Atlantic to U. K. or Continental ports*	23/6–25	36
Calif. to North Atlantic ports (not E. of N. Y.)	†$1.20	$0.90–$1.00
Gulf to North Atlantic ports (not E. of N. Y.)**	46	40

*Continental ports in the range between Bordeaux and Hamburg, both inclusive.
**Venezuela loading same rate. For Tampico 3c to 4c per bbl. additional.
†Prices nominal.

Two gallons or twenty.. *fast and accurate*



Sporty roadsters. Big ten-ton trucks. Cars with *any* tank capacity. Gilbert & Barker Meter Pumps fill them all "as fast as the tanks will take it."

The operator merely turns the switch, squeezes the trigger and the gas flows until the pressure is released. No lost motions or wasted time. Bigger sales from fewer pumps.

One large operator increased his gallonage on an average of two more gallons per car. A dealer jumped his sales 15 per cent in two months. This can readily be understood by those marketers who know that 53 model 1930 cars have a capacity of 15 gallons or more. Only meter pumps can fill such large tanks at one operation and without effort. That's why we call this G & B the "Star Salesman." Write or wire for Bulletin T-105.

GILBERT AND BARKER
MANUFACTURING COMPANY
PUMPS AND TANKS FOR THE OIL TRADE
SPRINGFIELD, MASS.

"DEPENDABLE PUMPS—FOR EVERY SERVICE STATION NEED"

Tank Wagon, Service Station Markets for Gasoline and Kerosene

(OIL PRICE HANDBOOK has t. w. and s. s. markets for a whole year, arranged for quick reference)

These Prices in Effect Mar. 10, 1930, as Posted by Principal Marketing Companies

S.O. NEW JERSEY TERRITORY

	Gasoline T.W.	Tax	Total T.W.	S.S.	Oil T.W.
Atlantic City, N. J.	14.5	2	16.5	18.5	13.5
Newark, N. J.	13.5	2	15.5	17.5	12.5
Annapolis	14	4	18	20	13
Baltimore, Md.	13.2	4	17.2	19.2	10.5
Cumberland, Md.	15	4	19	21	14
Washington, D. C.	13.7	2	15.7	17.7	12.7
Danville, Va.	14.8	5	19.8	21.8	13.8
Norfolk, Va.	13.3	5	18.3	20.3	11
Richmond, Va.	13.7	5	18.7	20.7	12.7
Roanoke, Va.	15	5	20	22	14
Petersburg, Va.	14.3	5	19.3	21.3	13.3
Charleston, W. Va.	14.5	4	18.5	20.5	12.5
Keyser, W. Va.	15.1	4	19.1	21.1	14.1
Parkersburg, W. Va.	13.2	4	17.2	19.2	11.2
Wheeling, W. Va.	14.4	4	18.4	20.4	12.4
Charlotte, N. C.	15.3	5	20.3	22.3	14.3
Hickory, N. C.	15.8	5	20.8	22.8	14.8
Mt. Airy, N. C.	15.5	5	20.5	22.5	14.5
Salisbury, N. C.	15.7	5	20.7	20.7	14.7
Charleston, S. C.	13.3	6	19.3	21.3	12.3
Columbia, S. C.	15.2	6	21.2	23.3	14.2

Note: 2c per gallon discount off t.w. price of gasoline to dealers and commercial consumers thru S. O. New Jersey territory.

CONTINENTAL OIL

Denver, Colo.	12	4	16	18	15.5
Pueblo, Colo.	14	4	18	19	15.5
Grand Junc., Colo.	18	4	22	25	19
Casper, Wyo.	14	4	18	21	14
Cheyenne, Wyo.	15.5	4	19.5	22.5	15.5
Butte, Mont.	18.5	5	23.5	26.5	20
Helena, Mont.	18.5	5	23.5	26.5	20
Salt Lake City, Utah	16.5	3½	20	23	17
Boise, Ida.	18.5	5	23.5	26.5	19
Twin Falls, Ida.	18.5	5	23.5	26.5	19
Albuquerque, N. M.	15	5	20	22	17

S. O. CALIFORNIA

				*Plant	
Phoenix, Ariz.	14	4	18	22	20
Los Angeles, Cal.	16.5	3	19.5	22.5	15.5
Fresno, Cal.	17	3	20	23	17
San Francisco, Cal.	17	3	20	23	15.5
Reno, Nev.	21	4	25	28	19
Portland, Ore.	16.5	4	20.5	23.5	16.5
Seattle, Wash.	16.5	3	19.5	22.5	16.5
Spokane, Wash.	20.5	3	23.5	26.5	20.5
Tacoma, Wash.	17.5	3	20.5	23.5	16.5

Note: 4c per gal. discount to dealers off t.w. price of gasoline to customers taking tank truck delivery, thru S. O. California territory except 1c discount at Phoenix to dealers only.

*Prices in the fourth column represent retail sale prices of gasoline for delivery into fuel tanks of customers' automotive equipment at S. O. California refineries, terminals and district depots as this company operates no retail service stations.

S. O. LOUISIANA

Little Rock, Ark.	11	5	16	18	13
Alexandria, La.	‡12	4	‡16	18	†14
Baton Rouge, La.	11	4	15	15	†14
Lake Charles, La.	††12	4	††16	††18	†14
New Orleans, La.	*11	4	*15	15	†12
Shreveport, La.	11	4	15	17	†14
Lafayette, La.	**13	4	**17	**19	†14
Bristol, Tenn.	14	5	19	20	14
Chattanooga, Tenn.	14	5	19	21	13
Knoxville, Tenn.	14	5	19	21	16
Nashville, Tenn.	13	5	18	20	16
Memphis, Tenn.	12	5	17	19	12.5

Note: 2c per gallon discount off t.w. price of gasoline to dealers thru S. O. Louisiana territory.

*New Orleans gasoline prices include 1c parish tax in addition to 4c state tax, and kerosene prices include 1c state tax and 1c parish tax.

†Kerosene price in Louisiana includes 1c state tax.

**Lafayette gasoline prices include 1c parish tax n addition to 4c state tax.

††Lake Charles gasoline prices include 1c parish tax.

‡Alexandria gasoline prices include 1c parish tax

S. O. KENTUCKY

Ashland, Ky.	15	5	20	21	15
Catlettsburg, Ky.	15	5	20	21	15
Lexington, Ky.	13	5	18	20	14.5
Louisville, Ky.	14	5	19	21	13
Covington, Ky.	14	5	19	20	14.5
Clarksdale, Miss.	13	5	18	20	12.5
Gulfport, Miss.††	15.5	5	20.5	22.5	13
Jackson, Miss.	14	5	19	21	13
Natchez, Miss.	13.5	5	18.5	20.5	13
Vicksburg, Miss.	13.5	5	18.5	20.5	13
Birmingham, Ala. ‡‡	16	4	20	22	14.5
Mobile, Ala‡	15	4	19	21	13.5
Montgomery, Ala.*	16	4	20	22	15
Atlanta, Ga.	14	6	20	22	†15.5
Augusta, Ga.	15	6	21	23	†15.5
Macon, Ga.	15	6	21	23	†15.5
Savannah, Ga.	14	6	20	22	†14
Jacksonville, Fla.	14	6	20	22	14
Miami, Fla.	15	6	21	23	14
Tampa, Fla.	14	6	20	22	13
Pensacola, Fla.**	12	6	18	20	13.5

Note: Net price of gasoline to dealers is 2c under posted t.w. price thru S. O. Kentucky territory.

•Local privilege tax of 1 cent on gasoline and ½ cent on kerosene at Montgomery included.

†Georgia kerosene prices include 1c state tax.

**Both tank wagon prices include 1c city tax at Pensacola which went into effect Oct. 15, 1926.

††Both tank wagon prices at Gulfport include Harrison county privilege tax of 2c.

‡Mobile gasoline prices include 1c city tax

‡‡Birmingham gasoline prices include 1c city tax.

Latest Changes in Tank Wagon Prices

Gasoline

S. O. New York—T.w. and s.s. cut 1c, thru Maine, New Hampshire, Massachusetts and Rhode Island, **Mar. 6.**

S. O. Kentucky—T.w. and s.s. up 1c, Birmingham, to 20c and 22c, due to the 1c per gallon local tax imposed on sales within the corporate limits of that city, **Mar. 1.**

S. O. Ohio—T.w. cut 1c, s.s. 2c, Mecca, Bazetta, Johnston and Fowler townships in Trumbull county, both to 17c, **Mar. 10.**

T.w. cut 1c, s.s. 2c, thru Scioto county, both to 17c, including 4c tax, **Feb. 24.**

S. O. Indiana—A 4½ cent per gallon discount off s.s. price on 100,000 gallons and over in tank truck delivery has been added to the Q.D.A. thru S. O. Indiana territory, except in Chicago, where this amount will be given 5c per gallon off s.s. price.

S. O. Louisiana—T.w. only cut 1c, Little Rock, to 16c, s.s. remaining unchanged at 18c. **Mar. 4.**

Continental Oil—T.w. and s.s. up 1c thru Idaho, due to increase of state tax to 5c per gallon, Feb. 25.

T.w. cut 2s, s.s. 3c, Denver, to 16c and 18c respectively, including 4c tax, **March 8.**

S.s. only cut 2c, Pueblo, to 19c, **March 8.**

Magnolia Petroleum—T.w. and s.s. cut 1c, Fort Smith, to 14c and 16c, **Feb. 28.**

S.s. only cut 2c, Little Rock, to 18c same as tank wagon, **Feb. 25.**

S. O. New Jersey—S.s. price only of gasoline cut 2c, Salisbury, to 20.7c, **March 5.** T.w. unchanged at 20.7c, including 5c tax.

Atlantic Refining—T.w. and s.s. prices gasoline cut 1c, thru Massachusetts and Rhode Island, meeting S. O. New York cut of same date, **March 6.**

Kerosene

S. O. New York—Kerosene cut 1c thru Maine, New Hampshire, Massachusetts and Rhode Island, **Mar. 6.**

Atlantic Refining—Kerosene cut 1c, Massachusetts, Rhode Island, and Connecticut, **March 6.**

S. O. NEBRASKA

	Gasoline T.W.	Tax	Total T.W.	S.S.	Oil T.W.
Omaha, Neb.	14.25	4	18.25	20.25	13.25
McCook	15.75	4	19.75	21.75	14.75
Norfolk	14.75	4	18.75	20.75	13.75
North Platte	15.75	4	19.75	21.75	14.50
Scottsbluff	15.75	4	19.75	21.75	14.25

S. O. INDIANA

Chicago, Ill.	14	3	17	18	13
Decatur, Ill.	14.2	3	17.2	18.2	13.1
E. St. Louis, Ill.	13.4	3	16.4	17.4	12.2
Joliet, Ill.	14.4	3	17.4	18.4	13.3
Peoria, Ill.	14.2	3	17.2	18.2	13.1
Quincy, Ill.	14.2	3	17.2	18.2	12.9
Indianapolis, Ind.	14.2	4	18.2	19.2	14.2
Evansville, Ind.	14	4	18	19	14
South Bend, Ind.	14.4	4	18.4	19.4	14.4
Detroit, Mich.	14.8	3	17.8	18.8	14.7
Grand Rapids, Mich.	14.7	3	17.7	18.7	14.6
Saginaw, Mich.	14.9	3	17.9	18.9	14.8
Green Bay, Wisc.	14.6	2	16.6	17.6	13.4
Madison, Wisc.	14.3	2	16.3	17.3	13.1
Milwaukee, Wisc.	14.1	2	16.1	17.1	12.9
La Cross, Wisc.	15.2	2	17.2	18.2	14
Minneapolis, Minn.	15.2	3	18.2	19.2	13.9
Duluth, Minn.	15.5	3	18.5	19.5	13.9
Mankato, Minn.	15.1	3	18.1	19.1	13.7
Des Moines, Ia.	14.5	3	17.5	18.5	13.3
Davenport, Ia.	14.5	3	17.5	18.5	13.3
Sioux City, Ia.	14.1	3	17.1	18.1	12.9
Mason City, Ia.	14.5	3	17.5	18.5	13.3
St. Louis, Mo.	*13.9	2	15.9	16.9	12.3
Kansas City, Mo.	†14.9	2	16.9	17.9	11.6
St. Joseph, Mo.	†14.5	2	16.5	17.5	12.2
Fargo, N. D.	16.9	3	19.9	20.9	15.9
Grand Forks, N. D.	17.2	3	20.2	21.2	16.2
Minot, N. D.	16.9	3	19.9	20.9	15.9
Pierre, S. D.	15	4	19	20	14.4
Huron, S. D.	15.3	4	19.3	20.3	14.7
Wichita, Kans.	12.8	3	15.8	14.8	11.8
Bartlesville, Okla.	12.5	4	16.5	17.5	11.5

S. O. Indiana's quantity contract price schedule thru territory except in Chicago and Detroit on tank truck deliveries of gasoline, figured from the service station price is 2c for 500 gals. or more a month; 2½c for 2000 gals. or more a month; 3c for 6000 gals. or more a month and 4½c for 100,000 gals. or more a month.

In Chicago and vicinity, these discounts apply. Over 500 gals. per month, 2c per gal. off service station price; over 1,000 gals. per month, 4c per gal. off service station price; over 100,000 gals. per month, 5c per gal. off service station price.

In Detroit, effective Feb. 8, 1930, dealers and consumers signing contract for all gasoline for year, get 4c per gal. off s.s. price. Non-contracted accounts get 3c off s.s. price.

*Includes city tax of ½c.

†Includes city tax of 1c.

S. O. OHIO

Ohio state-wide	14	4	18	19	12
†Darke, Hancock and Scioto Counties	13	4	17	17	†12
Athens County	11	4	15	15	12

Note: Discount to dealers and commercial accounts generally thru Ohio is 2c per gal. off t.w. price with some exceptions. In counties where prices are below normal, discount is 3c per gal. off t.w. price.

†Kerosene t.w. price in Darke County is 10c; in Paulding County 11c.

MAGNOLIA PETROLEUM

Muskogee, Okla.	10	4	14	16	10
Oklahoma City	11	4	15	18	10
Tulsa, Okla.	11	4	15	19	10
Fort Smith, Ark.†	10	†4	14	16	12
Little Rock, Ark.	13	5	18	18	13
Texarkana, Ark.*	13	*4	17	19	12
Dallas, Tex.	12	4	16	20	12
Fort Worth, Tex.	12	4	16	19	12
Houston, Tex.	11	4	15	19	11
San Antonio, Tex.	11	4	15	19	11
El Paso, Tex.	12	4	16	20	14

*Within city of Texarkana, the state tax on gasoline is 4c per gal. conforming with the Texas state tax. In this district outside of the city the 5c Arkansas tax applies.

†Within city of Fort Smith, Oklahoma tax of 4c applies. In this district outside of the city, the 5c Arkansas tax applies.

Above prices include these inspection fees on both gasoline and kerosene, per gallon: Alabama, 1/40c on gasoline, 1/2c kerosene; Arkansas, 1/20c on both; Florida, 1/8c on both; Georgia, 1/10c on both; Illinois, 3/100c on both; Indiana, 4/25c to 1/2c on both; Kansas, 3/50c on both; Louisiana, 1/32c on gasoline; Minnesota 3/50c on both; Missouri, 3/10c to 1/2c on both; Nebraska, 3/100c on both; North Carolina, 1/4c on both; North Dakota, 1/20c on both; Oklahoma, 4/25c on both; South Carolina, 1/8c on both; South Dakota, 1/10c on both; Tennessee, 2/5c on gasoline and kerosene; 1/2c to 4/5c on Wisconsin, 3/50c on both.

Kerosene inspection fees only, per gallon; Iowa, 7/100c; Michigan 1/5c to 4/5c per gal.

Tank Wagon, Service Station Markets for Gasoline and Kerosene

Prices in Effect Mar. 10, 1930

S. O. NEW YORK

Due to local price conditions at many points in S. O. New York territory, actual prices on both gasoline and kerosene are being made at under the posted tank wagon prices published below.

	Gasoline T.W.	Tax	Total T.W.	S.S.	Oil T.W.
Greater New York City: Boroughs of Manhattan, Bronx, Queens & Kings	12.3	2	14.3	16.3	11.3
Borough of Richmond	12.7	2	14.7	16.7	11.7
Albany, N. Y.	13.6	2	15.6	17.6	12.6
Buffalo, N. Y.	12.8	2	14.8	16.8	11.8
Rochester, N. Y.	13	2	15	17	12
Syracuse, N. Y.	13.8	2	15.8	17.8	12.8
Boston, Mass.	12.5	2	14.5	16.5	11.5
Augusta, Me.	13.8	4	17.8	19.8	12.8
Manchester, N. H.	13.4	4	17.4	19.4	12.4
Burlington, Vt.	14.3	4	18.3	20.3	13.3

Note: S. O. New York allows 3c off t.w. price to dealers in New York City, and 2c off t.w. price thru rest of territory.

ATLANTIC REFINING

Pittsburgh, Pa.	15	*	15	21	13
Philadelphia, Pa.	15	*	15	21	13
Allentown, Pa.	15	*	15	21	13
Erie, Pa.	15	*	15	19	13
Scranton, Pa.	15	*	15	21	13
Altoona, Pa.	15	*	15	21	13
Dover, Del.	15	3	18	20	13
Wilmington, Del.	15	3	18	20	13
Boston, Mass.	12.5	2	14.5	16.5	11.5
Springfield, Mass.	13.5	2	15.5	17.5	12.5
Worcester, Mass.	13.3	2	15.3	17.3	12.3
Fall River, Mass.	13.1	2	15.1	17.1	12.1
Providence, R. I.	12.7	2	14.7	16.7	11.7
Hartford, Conn.	13.5	2	15.5	17.5	12.5
New Haven, Conn.	13.6	2	15.6	17.6	12.6
Atlantic City, N. J.	14.5	2	16.5	18.5	13.5
Camden, N. J.	13.6	2	15.6	17.6	12.6
Trenton, N. J.	14	2	16	18	13
Annapolis, Md.	14	4	18	20	13
Baltimore, Md.	13.2	4	17.2	19.2	10.5
Hagerstown, Md.	14.7	4	18.7	20.7	13.7
Richmond, Va.	13.7	5	18.7	20.7	12.7
Wilmington, N. C.	13.4	5	18.4	20.4	12.4
Brunswick, Ga.	14	6	20	22	**15
Jacksonville, Fla.	14	6	20	22	14

Note: 2c per gal. discount off t.w. price of gasoline on sales to dealers; discount to commercial accounts under contract for one year in accordance with Code of Ethics.

*4-cent state tax is collected by retail dealer and paid by him directly to state.

**Georgia kerosene prices include 1c state tax.

V. M. & P. NAPHTHA

(Changes ordinarily occur coincident with gasoline price changes)

	Oleum Spirits	V.M.&P. Naphtha	Cleaner Naphtha
Chicago	14.7	16.7	17
Detroit	17.4	18.9	20.7
Kansas City	†15.9	†17.4	†19.2
Milwaukee	16.4	*19.9	*21.7
Minneapolis	**20.7	**22.2	**24
St. Louis	15.6	17.1	18.9
New York		16	23
Boston		19	23

*Includes 2c state tax. †Includes 1c city tax.
**Includes 3c state tax.

Petroleum Spirits (Solvent)

Tank Cars (F.o.b. refinery or seaboard terminal)

New York harbor	11.00
Philadelphia district	11.00
Providence	11.50

Tank Wagon or Steel Barrels

New York City	18
Syracuse	18
Rochester	18
Buffalo	18
Providence	19
Boston	19
Bridgeport	18
Newark	18
Philadelphia	16
Baltimore	18

Note: 2c off above t.w. prices to large buyers in some instances.

(Continued on Page 108)

HOW MUCH HAS IT COST YOU

For The Oil That Has Leaked Away?

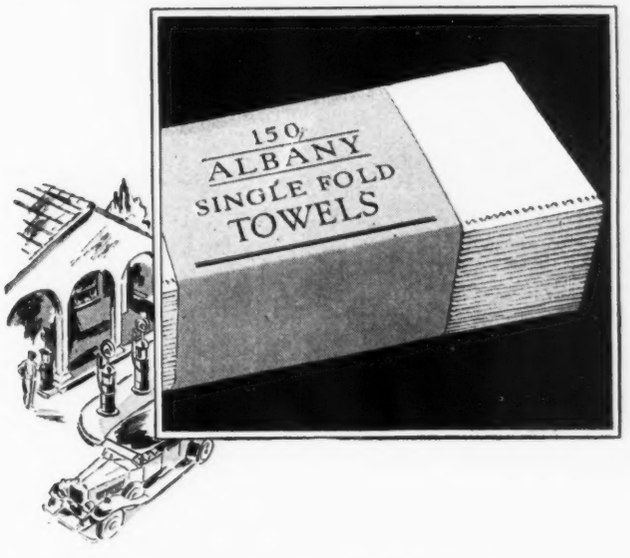
This loss is unnecessary, and could be prevented by the use of Brown Oil-tight Storage Tanks

NO EXTRA COST

Send us your inquiry

BROWN SHEET IRON & STEEL CO.

St. Paul, — Minnesota



Equip your stations with this better towel

DEPENDABLE service—at lower cost. That's what you get when you equip your service stations with A. P. W. Albany Victor paper towels. They're better towels. And they save you money.

You'll like Albany Victors. They're big. Extra absorbent. Super-soft—yet strong enough for the toughest kind of cleaning job. Double-duty towels. They please your customers—and give your men better kind of towel service—every day in the year.

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Please send us full information on why it saves money to install Albany Victor Towels.

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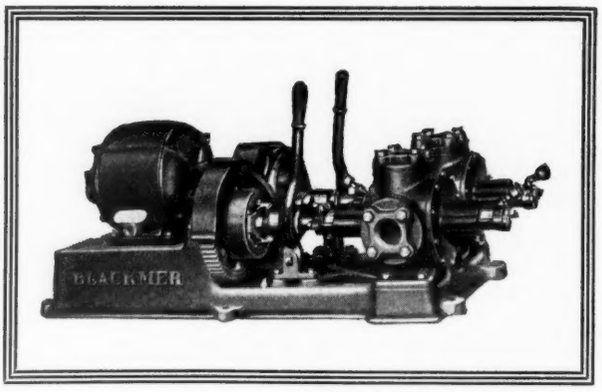
WHAT MAKES A PUMP GOOD?



Standard Double Motor Unit

Materials can be ever so good. Workmanship can be of first order and above fault. Intentions may be the best.

But the continued usefulness of a pump depends upon one thing, first of all: *DESIGN*. The engineering principle must be the best. If it isn't, all the fine materials, high-grade skill, and good intentions won't give satisfactory service.

Design is the keynote of Blackmer achievement. A simple, time-tested design is the formula by which raw materials, when put in the hands of skilled labor and machinery, are converted into one of the outstanding pumps of the world. Design prompted the famous Blackmer "bucket" principle, a master stroke in rotary pump engineering, which has been successfully used for nearly thirty years.

Blackmer leadership in design is the leadership which counts. For it makes possible the highest quality at low cost. It assures you efficient, dependable, long-time service. It brings you a pump which will at all times deliver "More Gallons Per Dollar".

The Blackmer Rotary Pump is not only a GOOD Pump, but one which is worthy of your earnest investigation. A Blackmer engineer will gladly serve you. Write for appointment today.

BLACKMER ROTARY PUMPS

BLACKMER PUMP CO.

1801-B Century Avenue, Grand Rapids, Michigan

Crude Oil Prices (in Effect March 10, 1930)

(Crude prices for the whole year in OIL PRICE HANDBOOK published annually)

EASTERN FIELDS

(Posted by Joseph Seep Purchasing Agency)
(All Penna. Grade Crude Effective Feb. 17, 1930)

†Bradford—Alleghany district.....$3.00
Bradford District Oil in New York Transit Lines (Bradford District).....††$2.75
Bradford District Oil in National Transit Lines (Bradford District).....††2.75
Penna. Grade Oil in National Transit Lines (Other Pennsylvania).....*2.80
Penna. Grade Oil in Southwest Penna. Pipe Lines (Other Pennsylvania)..... 2.75
Penna. Grade Oil in Eureka Pipe Lines (West Virginia)..... 2.65
Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O. district)..... 2.45
Wayne district crude in Cumberland lines (West Virginia)..... 1.24
Corning Grade in Buckeye Pipe Lines (Ohio) (Effective Feb. 17, 1930)..... 1.65
Corning, O., heavy grade (Effective Feb. 17, 1930) 1.55
Somerset Oil in Cumberland Pipe Lines (Kentucky) (Effective Feb. 17, 1930).... 1.37
Somerset Oil in Eureka Pipe Lines (Effective Feb. 17, 1930)..... 1.21
Ragland Grade in Cumberland Pipe Lines (Kentucky) (Effective Jan. 29, 1929)....$0.60

*Oil run prior to July 1, 1929 is $2.75 per bbl.
†Posted by Tide Water Pipe Co., Ltd.
††Oil run prior to July 1, 1929 is $2.70 per bbl.

(Posted by Stoll Oil Refining Co.)

Oil City, Ky., oil in Stoll lines (Effective Feb. 19, 1930).....$1.45

MICHIGAN

(Posted by Dixie Oil Co.)

Traverse and Dundee (Muskegon):

32-32.9	$1.08	39-39.9	$1.29
33-33.9	1.11	40-40.9	1.32
34-34.9	1.14	41-41.9	1.35
35-35.9	1.17	42-42.9	1.38
36-36.9	1.20	43-43.9	1.41
37-37.9	1.23	44 and above	1.44
38-38.9	1.26		

(Posted by Pure Oil Co.)

Midland, Midland County.....$1.25

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.
Effective Feb. 15, 1930

Wooster	$1.75	Princeton	$1.60
Lima	1.65	Illinois	1.60
Waterloo	1.20	Plymouth	1.18
Indiana	1.42	West Kentucky	1.50

CANADIAN CRUDE

Posted by Imperial Oil Refineries, Ltd.

Petrolia.....$2.05
Oil Springs..... 2.12

OKLAHOMA, KANSAS and NORTH TEXAS

Prices of Prairie Oil & Gas Co.
(In Oklahoma, Kansas, North and East Central Texas)
Effective Feb. 15, 1930

Below 25	$0.60	35-35.9	$1.17
25-25.9	0.66	36-36.9	1.20
26-26.9	0.72	37-37.9	1.23
27-27.9	0.78	38-38.9	1.26
28-28.9	0.84	39-39.9	1.29
29-29.9	0.90	40-40.9	1.32
30-30.9	0.96	41-41.9	1.35
31-31.9	1.02	42-42.9	1.38
32-32.9	1.08	43-43.9	1.41
33 33.9	1.11	44 and above	1.44
34-34.9	1.14		

Above prices were posted by Humble and The Texas Co. on Jan. 15; on Jan. 16 by Magnolia in Texas, and Jan. 17 in Oklahoma and Kansas; and on Feb. 13 by Sinclair; by Carter Oil on Jan. 16.

Humble Oil & Refining Co. Prices
(Ranger, North Texas, Mexia, Powell, Boggy Creek, Richland, Wortham, Lytton Springs, Currie, Moran and Nocona crudes all in Texas.)

Humble's prices in above fields same as Prairie's, but effective Jan. 15, 1930.

Magnolia Petroleum Co.
(In Oklahoma, Kansas and North and East Central Texas)

Magnolia posts in above fields and in Panola Co., same schedule as Prairie, which see. Its postings in Texas were effective Jan. 16, and in Oklahoma and Kansas, Jan. 17, 1930.

Jan. 16, 1930, Glasscock, Crane, Upton, Winkler, Howard and Mitchell Counties same prices as Humble's postings in Winkler, Crane, etc., which see.

Iatan district	$0.93
Corsicana heavy	0.75
Luling	0.75
Mirando	0.75
Darst Creek, 60° F. gravity	1.05

Carter Oil Co.
(Oklahoma and Kansas)

Jan. 16, 1930, same schedule as Prairie, which see.

PANHANDLE, TEXAS

Humble Oil & Refining Co.
Effective Jan. 15, 1930

Hutchinson and Carson Counties:

Below 32	$0.72	38-38.9	$0.96
32-32.9	0.78	39-39.9	0.99
33-33.9	0.81	40-40.9	1.02
34-34.9	0.84	41-41.9	1.05
35-35.9	0.87	42-42.9	1.08
36-36.9	0.90	43-43.9	1.11
37-37.9	0.93	44 and above	1.14

Wheeler County:

Below 30	$0.70	37-37.9	$1.03
30-30.9	0.76	38-38.9	1.06
31-31.9	0.82	39-39.9	1.09
32-32.9	0.88	40-40.9	1.12
33-33.9	0.91	41-41.9	1.15
34-34.9	0.94	42-42.9	1.18
35-35.9	0.97	43-43.9	1.21
36-36.9	1.00	44 and above	1.24

Gray County:

Below 29	$0.69	37-37.9	$1.08
29-29.9	0.75	38-38.9	1.11
30-30.9	0.81	39-39.9	1.14
31-31.9	0.87	40-40.9	1.17
32-32.9	0.93	41-41.9	1.20
33-33.9	0.96	42-42.9	1.23
34-34.9	0.99	43-43.9	1.26
35-35.9	1.02	44 and above	1.29
36-36.9	1.05		

Above prices met by The Texas Co. on Jan. 15, and Magnolia on Jan. 16.

WEST TEXAS

Humble Oil & Refining Co.
Effective Jan. 15, 1930

Winkler, Crane, Upton, Crockett, and Pecos Counties, also Lea County, N. Mex.

Below 25	$0.55	31-31.9	$0.76
25-25.9	0.58	32-32.9	0.79
26-26.9	0.61	33-33.9	0.82
27-27.9	0.64	34-34.9	0.85
28-28.9	0.67	35-35.9	0.88
29-29.9	0.70	36 and above	0.91
30-30.9	0.73		

Howard and Glasscock counties:
Effective Jan. 15, 1930

Below 25	$0.55	31-31.9	$0.72
25-25.9	0.58	32-32.9	0.74
26-26.9	0.61	33-33.9	0.76
27-27.9	0.64	34-34.9	0.78
28-28.9	0.66	35-35.9	0.80
29-29.9	0.68	36 and above	0.82
30-30.9	0.70		

Jan. 15, 1930, The Texas Co. posted same prices in Crane, Upton, Winkler and Lea, and Magnolia, on Jan. 16, in Crane, Upton, Winkler, Glasscock, Howard and Mitchell as Humble in Winkler, Crane etc.

SOUTHWEST TEXAS

(Posted by Humble Oil & Refining Co.)
Effective Jan. 15, 1930

Mirando	$0.75
Salt Flat	1.05
Darst Creek	1.05

NORTH LOUISIANA—ARKANSAS FIELDS

Prices of Standard Oil Co. of Louisiana

Caddo, Homer, Haynesville, Bull Bayou, El Dorado, Crichton, De Soto, Sabine and **Cotton Valley.
Effective Jan. 16, 1930

Below 28	$0.78	36-36.9	$1.20
28-28.9	0.84	37-37.9	1.23
29-29.9	0.90	38-38.9	1.26
30-30.9	0.96	39-39.9	1.29
31-31.9	1.02	40-40.9	1.32
32-32.9	1.08	41-41.9	1.35
33-33.9	1.11	42-42.9	1.38
34-34.9	1.14	43-43.9	1.41
35-35.9	1.17	44 and above	1.44

**Cotton Valley, below 36, $0.80. Beginning with 36-36.9, same schedule as above.

Smackover, below 24	$0.85
do 24 and above	1.00
Bellevue (Jan. 16, 1930)	1.05
*Urania, La. (Jan. 16, 1930)	0.85
†East El Dorado	0.75

*Posted by Louisiana Oil Refining Corp.
†Posted by Magnolia Petroleum Co.

Jan. 15, 1930, The Texas Co. same schedule in Louisiana as Standard, plus these grades: 24-24.9, $0.60; 25-25.9, $0.66; 26-26.9, $0.72; 27-27.9, $0.78.

Jan. 16, Magnolia, Louisiana Oil, and Gulf Companies met Standard schedule in Louisiana-Arkansas fields.

STEPHENS, ARKANSAS

Louisiana Oil Refining Corp., and Atlantic Oil Producing Co.
Effective Jan. 16, 1930

Below 28	$0.70	30-30.9	$0.85
28-28.9	0.75	31-31.9	0.90
29-29.9	0.80	32 and above	0.95

GULF COASTAL

Posted by Humble Oil & Refining Co.
Effective Jan. 15, 1930

Grades A	$1.05	29-29.9	$1.05
Grades B:		30-30.9	1.08
Below 25	0.90	31-31.9	1.11
25-25.9	0.93	32-32.9	1.14
26-26.9	0.96	33-33.9	1.17
27-27.9	0.99	34-34.9	1.20
28-28.9	1.02	35 and above	1.23

Fields classified as A and B are Spindletop, Goose Creek, Hull, Liberty, Sour Lake, West Columbia, Orange, Boling, Pierce Junction, Sugarland and Raccoon Bend. All other fields are Grades A only

Oil Stocks Rising to New High Levels

WASHINGTON, March 7.—Five per cent more gasoline was produced in January of this year than in January, 1929, while domestic demand was 2,769,000 barrels higher or 12 per cent. Stocks were 9,000,000 barrels higher than a year ago, according to the U. S. Bureau of Mines.

Gasoline production totaled 36,654,000 barrels in January, compared with production of 34,690,000 barrels in January, 1929. This is at the daily average rate of 1,182,000 barrels last January, as compared with a daily average of 1,119,000 barrels in January, 1929.

Gasoline stocks stood at 49,676,000 barrels on Jan. 31, compared with stocks of 43,132,000 barrels on Dec. 31, and 40,669,000 barrels at the end of January a year ago.

Crude production decreased in January under December as well as January, 1929. A total of 79,453,000 barrels was produced in January which is at the rate of 2,563,000 barrels daily average. The daily average production in January a year ago was 2,644,000 barrels, while in December it was 2,592,000 barrels.

Stocks of crude east of California totaled 379,826,000 barrels at the end of January, compared with 381,391,000 barrels at the end of December, and 373,913,000 barrels at the end of January, 1929.

There was a net decrease of little over 500,000 barrels in crude stocks in the entire country in January, as compared with the previous month.

Total stocks of all oils continued to rise to new high levels and amounted to 687,049,000 barrels on Jan. 31, a gain of 4,980,000 barrels over December.

The production and stocks of kerosene were lower. The production of gas oil and distillate fuel oils, reported to the Bureau for the first time, amounted to 6,707,000 barrels, and that of residual fuel oils to 26,506,000 barrels.

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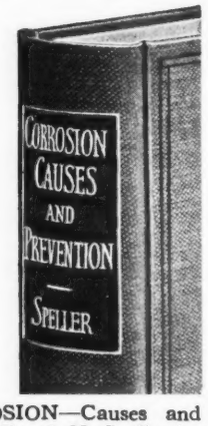

CORROSION—Causes and Prevention by Frank N. Speller is the result of 20 years' close study of the subject.

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Part II is devoted entirely to practical discussion of preventive measures. In the chapter on corrosion in the petroleum industry the author discusses refinery problems and methods of prevention of corrosion of pipe lines.

The depreciation due to corrosion in the petroleum industry is so great that its solution will probably mean the difference between profit and loss in the future. Mr. Speller in his book reduces the subject of corrosion to a science, and every petroleum engineer should have a copy.

621 pages—illustrated, Price $6.

LUBRICATING OIL SALESMAN'S PRIMER

The "Lubricating Oil Salesman's Primer" is a new book by Claude Ettele, associated with one of the big oil companies in this country. The author's purpose is "to properly present a first view of the subject of lubrication and encourage the young salesman to study advanced works without which he will be unable to develop maximum efficiency in the services of his employers and of his customers."

The book takes up the manufacture of various lubricating oils and greases; tests by which oil and grease specifications are written; general discussion of lubrication problems in cylinders, turbines, internal combustion engines; power transmission machinery such as shafting; wire ropes; belts, gears, bearings, etc., driven machines such as air compressors, pneumatic tools, ice machinery, machine tools, textile machinery, paper mills, mine and quarry machinery.

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.....

.....

Crude Oil Prices (in Effect March 10, 1930)

(Crude Oil Prices for the whole year in OIL PRICE HANDBOOK published annually)

GULF COASTAL

Prices of The Texas Co.

Effective Jan. 15, 1930

Grades A	$1.05	*Grades B	$0.90
‡Grades B (light crude)			
35–35.9	$1.23	40–40.9	$1.36
36–36.9	1.26	41–41.9	1.38
37–37.9	1.29	42–42.9	1.40
38–38.9	1.32	43–43.9	1.42
39–39.9	1.34	44 and above	1.44

*Grades B include all heavy crudes which do not meet tests for Grades A or for Gulf Coast light crude.

‡The Texas Co.'s gravity and price schedule on all oil below 35° is same as Humble's postings on Grades B.

ROCKY MOUNTAIN FIELDS

Prices of Ohio Oil Co., and Midwest Refining Co.

(Salt Creek prices effective Feb. 15, 1930)

‡Salt Creek 29–29.9	$0.90
" " 30–30.9	0.96
" " 31–31.9	1.02
" " 32–32.9	1.08
" " 33–33.9	1.11
" " 34–34.9	1.14
" " 35–35.9	1.17
" " 36–36.9	1.20
" " 37 and above	1.23
Elk Basin	1.45
Grass Creek light	1.45
Big Muddy	$1.33
Lance Creek	1.53
Rock Creek	1.25
Mule Creek	1.20
Rex Lake	1.10
‡Osage	1.65
‡Cat Creek, Mont.	1.45
Sunburst, Mont.	1.65
‡Hogback, N. Mex.	1.70
Artesia, N. Mex.	1.00

‡Posted by Midwest Refining Co. Midwest also buys Grass Creek light and Elk Basin.

CALIFORNIA

***Standard Oil Co. of California**

Gravity	Alamitos Heights Huntington Beach Signal Hill Seal Beach	Inglewood Torrance	Olinda-Brea Canon †Richfield	Athens-Rosecrans Dominguez	Elwood Terrace	Whittier La Habra	Coyote Hills	Santa Fe Springs	Newhall McKittrick Kern River	Midway Sunset Buena Vista & Elk Hills	Lost Hills	Coalinga	Wheeler Ridge	Montebello	Kettleman Hills	*Santa Maria (Orcutt)	*Ventura
14–14.9	$ .70	$ .70	$ .70	....	....	$ .70	$ .70	....	$ .50	$ .50	$ .50	$ .50	$ .50	$ .70	....	$ .65	$ .70
15–15.9	.70	.70	.70	....	....	.70	.70	....	.50	.50	.50	.50	.50	.70	....	.65	.70
16–16.9	.70	.70	.70	....	....	.70	.70	....	.50	.50	.50	.50	.50	.70	....	.65	.70
17–17.9	.70	.70	.70	....	....	.70	.70	....	.50	.50	.50	.50	.50	.70	....	.65	.70
18–18.9	.75	.75	.75	....	....	.75	.75	....	.50	.56	.56	.56	.56	.70	....	.70	.75
19–19.9	.80	.80	.80	....	....	.80	.80	....	.50	.62	.62	.62	.62	.75	$1.65	.70	.80
20–20.9	.85	.85	.85	....	....	.84	.84	....	....	.68	.68	.68	.68	.80	for	.70	.85
21–21.9	.89	.89	.89	....	....	.88	.88	.89	....	.74	.74	.74	.74	.85	55°	.86	.86
22–22.9	.93	.93	.93	....	....	.91	.91	.92	....	.80	.80	.80	.80	.90	gravity	.87	.87
23–23.9	.97	.97	.97	....	....	....	.94	.95	....	.85	.85	.85	.85	.95	and	.90	.90
24–24.9	1.01	1.01	1.01	1.01	....	....	.97	.98	....	.90	.90	.88	.88	.98	over	.94	.94
25–25.9	1.05	1.05	1.05	1.05	....	....	1.00	1.01	....	.95	.95	.91	.91	1.01	....	.98	.98
26–26.9	1.09	1.09	1.09	1.09	....	....	1.04	1.04	....	1.00	1.00	.94	.94	1.04	....	1.02	1.02
27–27.9	1.13	1.13	1.13	1.13	....	....	1.08	1.07	....	1.05	1.05	.98	.97	1.07	....	....	1.06
28–28.9	1.17	1.17	1.17	1.17	....	....	1.12	1.10	....	1.10	1.10	1.02	....	1.10	....	....	1.10
29–29.9	1.21	....	1.21	1.21	....	....	1.16	1.15	....	1.16	1.16	1.06	....	1.13	....	....	1.14
30–30.9	1.25	....	1.25	1.25	....	....	1.20	1.20	....	1.22	1.22	1.10	....	1.16	....	....	1.18
31–31.9	1.30	....	1.30	1.30	....	....	....	1.25	....	1.28	1.28	1.14	....	....	....	....	1.23
32–32.9	1.35	....	....	1.35	....	....	....	1.30	....	1.34	1.34	1.18	....	....	....	....	1.28
33–33.9	....	....	....	1.41	....	....	....	1.35	....	1.40	1.40	1.22	....	....	....	....	1.34
34–34.9	....	....	....	1.47	$1.16	....	....	1.40	....	....	1.46	1.26	....	....	....	....	....
35–35.9	....	....	....	1.53	1.22	....	....	1.45	....	....	1.52	1.30	....	....	....	....	....
36–36.9	....	....	....	1.59	1.28	....	....	1.50	....	....	....	....	....	....	....	....	....
37–37.9	....	....	....	1.65	1.34	....	....	1.55	....	....	....	....	....	....	....	....	....
38–38.9	....	....	....	1.71	1.40	....	....	1.60	....	....	....	....	....	....	....	....	....
39–39.9	....	....	....	1.77	1.46	....	....	1.65	....	....	....	....	....	....	....	....	....
40–40.9	....	....	....	1.83	1.52	....	....	....	....	....	....	....	....	....	....	....	....
41–41.9	....	....	....	1.89	1.58	....	....	....	....	....	....	....	....	....	....	....	....
42–42.9	....	....	....	1.95	1.64	....	....	....	....	....	....	....	....	....	....	....	....

*Santa Maria and Ventura postings are by Union Oil Co. Union Oil Co. posts same prices in all above fields as Standard except it does not post prices in Wheeler Ridge, Whittier, La Habra, Newhall and Kettleman Hills. Standard does not contract for crude testing 11-13.9 gravity, but pays 45c a barrel when purchased.

†Richfield posted only to 30-30.9 at $1.25.

REFINERS' and COMPOUNDERS' SUPPLIES

Following are average market prices for materials used by refiners and compounders effective on the date shown.

Refiners' Supplies

	Mar. 10	Mar. 3
Soda Ash light 58% bags, cwt.	$1.32	$1.32
Silicate of Soda 60 deg. drums, cwt.	$1.55	$1.55
Silicate of Soda 40 deg. tank cars, cwt.	$0.60	$0.60
Silicate of Soda 40 deg. drums cwt.	$0.80	$0.80
Sal Soda wks.	$1.00–1.05	$1.00–1.05
Caustic Soda 76% solid, cwt.	$2.90	$2.90
Sulfuric Acid 60 deg. tank cars, f.o.b. shipping point per ton	$11.00	$11.00
Oleum 20%, fuming sulfuric, tank cars, wks.	$18.50	$18.50
Sulfur, flowers of cwt.	$3.10–4.00	$3.10–4.00
Liquid Chlorine, tank cars, wks. lb.	3.50–5.00	3.50–5.00

Compounders' Supplies

	Mar. 10	Mar. 3
Vegetable Oils		
Linseed carloads, spot lb.	14.00	14.00
Tanks, spot	13.00	13.00
Soya Bean, Tank, coast, lb.	9.00–9.50	9.00–9.50
Oleic Acid		
Distilled, tanks lb.	9.25–9.50	9.25–9.50
Distilled, bbls. lb.	10.125-10.375	10.125-10.375
Saponified, tanks lb.	9.25	9.25
Saponified, bbls. lb.	10.125–10.625	10.125–10.625
Lard Oils		
Prime Winter Strained lb.	13.50	13.50
Extra Winter Strained lb.	12.50	12.50
Extra lb.	12.00	12.00
Extra No. 1 lb.	11.25	11.25
No. 1 lb.	11.00	11.00
No. 2 lb.	10.75	10.75
Tallow oil lb.	10 00	10.50
Neatsfoot Oil		
Pure, bbls. lb.	13.50	13.50
Extra, bbls. lb.	11.50	11.50
No. 1 bbls. lb.	11.00	11.00
Cold Pressed lb.	18.00	18.00
Fish Oils		
Menhaden Oil		
Light Pressed gal.	63–65	63–65
Light Pressed, tank cars, N. Y. gal.	5[illegible]	53
White bleached gal.	67	67
Yellow bleached gal.	61	61
Whale, extra winter bleached, gal.	85	85
Naval Stores		
Steam, distilled turpentine, N. Y. gal.	51	51
Steam distilled turpentine, Savannah gal.	45	46
Gum turpentine, N. Y. gal.	56.50	57
Gum turpentine, f.o.b. cars Savannah gal.	53	50.50
Wood Rosin, N.Y. gal.	$7.30	$7.50
Wood Rosin F, Savn'h bbl	$6.50	$6.70
Gum Rosin B, N. Y. bbl	$7.60	$8.20
Gum Rosin B, f.o.b. cars Savannah bbl.	$6.50	$7.10
Rosin oil, pure gal.	58	60
Rosin oil, compounded gal.	58	60
Pine Tar		
Kiln burnt bbl.	$13.00–14.00	$11.00–13.00
Retort bbl.	$13.50–14.50	$13.50–14.50
Alcohol		
Denatured Formula 5, in bbls., per gal.	54–57	57–64

OIL STOCKS AND FINANCES

National Petroleum News

Standard Group Sets New Dividend Record

NEW YORK, March 8.—Dividends being paid the first quarter of this year by the Standard Oil group of companies are the largest of any first quarter payments made by the group, according to a compilation made by Carl H. Pforzheimer & Co., New York.

The payments amounted to $65,738,224, an increase of more than $2,600,000 over payments the first quarter of 1929 but approximately $9,300,000 less than payments in the last quarter of 1929.

The largest first quarter payment was that of the Standard Oil Co. (N. J.) which amounted to $12,709,484. The first quarter record since the dissolution is:

1930	$65,738,224
1929	63,101,701
1928	48,927,760
1927	55,873,413
1926	40,580,317
1925	34,355,618
1924	34,975,867
1923	33,499,988
1922	28,206,068
1921	28,987,611
1920	26,796,606
1919	26,759,502
1918	26,483,747
1917	23,097,668
1916	22,179,085
1915	15,241,966
1914	17,904,636
1913	†55,652,423
1912	10,220,396

*Revised. †Includes $39,335,352 disbursed by Standard Oil Co. of New Jersey from repayment of loans to former subsidiaries.

I. T. I. O. Votes More Capital Stock

NEW YORK, March 7.—Stockholders of Indian Territory Illuminating Oil Co. have voted to change the authorized capital structure from 9,500,000 $1 par shares of common stock to 9,500,000 shares of no par voting Class B common and 5,500,000 shares of no par Class A non-voting common.

Of the latter issue 1,250,000 shares will be used in the acquisition of the Foster Petroleum Corp. which operates with I.T.I.O. in the Oklahoma City pool. At present I.T.I.O. has outstanding about 7,500,000 $1 shares.

The company, which is controlled by Cities Service Co., netted in the year ended Oct. 31, 1929, $3,033,280 after all expense, depreciation, depletion and taxes, or 39 cents on each $1 share.

The Oct. 31 balance sheet showed total assets of $70,487,331 with surplus of $20,257,908. Current assets amounted to $19,055,895.

Missouri-Kansas Line Increases Capital

CHICAGO, March 7.—Stockholders of the Missouri-Kansas Pipe Line Co. has approved an increase in the $5 par common stock to 5,000,000 shares from 700,000 shares and to create 5,000,000 shares of $1 par Class B common. The previous capitalization included 10,000 shares of $100 par 7 per cent preferred stock but none of this had been issued.

Directors have decided to place 700,000 shares of the new Class B stock in a voting trust and issue certificates which will be offered common stockholders. It was decided not to issue any more Class B stock to any individual or group of individuals but only to stockholders pro rata.

The B stock trust certificates are to be listed on the New York Curb.

Financial Notes

Washington Oil Co.—Dividend to be paid March 20 will be 75 cents a share. In previous quarter the company paid $1.

Illinois Pipe Line Co.—The special dividend of $4.50 a share payable March 25 to stock of March 15 record represents an adjustment dividend for the Dec. 15-March 15 quarter. March 15 is the effective date for the exchange of one share of Illinois stock for three of Ohio Oil Co. preferred stock.

Royal Dutch—Exchange proposed of 5 per cent 50-year bonds for the 4½ per cent priority shares of which 28,500 of 1000 guilders par are outstanding.

The bonds are to be redeemable at any time at 102½.

Shell Trading & Transport Co.—Underwriting being arranged for £5,000,000 of 7 per cent second preference shares.

Lion Oil Refining Co.—All directors re-elected at annual meeting.

Standard Oil Co. of Indiana—A. W. Peake elected a director to replace T. S. Cooke who resigned to devote his entire attention to the Pan American Petroleum & Transport Co. affairs. At directors' meeting Mr. Peake was elected a vice-president in charge of production.

Carib Syndicate, Ltd.—Board of directors reduced from 11 to 7 and the following retained. A. H. Bunker, chairman; H. J. Wasson, president; Reginald Halladay, Charles Hayden, Ernest Stauffen, Jr., E. D. Schafer, and C. F. French.

Shell Union Oil Corp.—Shell Gas & Electric Co. formed in California to handle natural gas output of Shell Oil Co. of California. All stock is held within the Shell organization.

Standard Oil Co. (N. J.)—Earnings in 1929 are reported to at least equal 1928 earnings which were $108,485,686, or $4.43 a share on the 24,484,219 outstanding $25 shares.

Transcontinental Oil Co.—Company had 20,742 stockholders Feb. 8 as compared with 14,245 last July 1.

Warner-Quinlan Co.—Reduction in dividend from 50 to 25 cents a share a quarter was done to conserve cash to take advantage of low gasoline prices, the company announced. Earnings were reported to have been in excess of the 50 cents a quarter rate paid in 1929. President W. W. McFarland predicted success for the effort to hold production to market requirements.

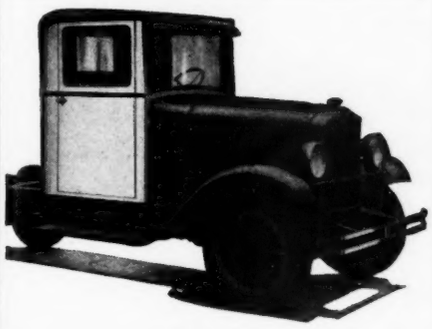
Cities Service Co.—Net to stock and reserves in 12 months ended Jan. 31 was $38,313,959 as compared with $29,868,249 in preceding 12 months.

British-American Oil Splits Its Stock

CLEVELAND, March 8.—British-American Oil Co., Ltd., with headquarters in Toronto and marketing facilities through Canada, has split its stock 2 for 1. Stockholders have approved an issue of $5,000,000 5 per cent 15-year convertible debentures.

The declaration of a dividend of 40 cents a share on the old stock forecasts a 20-cent quarterly rate on the new stock, the equivalent of $1.60 a year on the old stock, which last year paid $1 regular and an extra of 50 cents a share Jan. 1.

According to S. R. Parsons, chairman, earnings have been satisfactory in spite of a crop failure in western Canada last year which curtailed consumption of petroleum products.



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Transactions in Oil Shares on New York Stock Exchange

1928 High	1928 Low	1929 High	1929 Low	Listed Capital	Par Value	Stocks	Div. Rate	Last Paid	Transactions Week Ended Mar. 8 Sales	First	High	Low	Last	Change
43⅞	27⅛	42⅝	17½	(sh) 992,075	N.P.	Amerada Corp.	50cQ	Jan. 31, 30	14,000	18	18½	18	18½	+ ½
85	51¼	64¾	12½	(sh) 209,180	N.P.	American Republics Corp.	....	.....	29,500	23½	27⅞	23½	27⅛	+ 3⅜
53⅜	37½	47¼	32½	$56,000,000	$25	Associated Oil.	50cQ	Dec. 31, 29	80	33	33⅜	33	33⅜	+ ⅜
62½	50	77⅞	30	50,000,000	25	Atlantic Refining.	‡25cQ	Dec. 16, 29	114,000	39⅜	44½	38⅞	43⅞	+ 5⅛
53	20	49⅜	20	47,261,125	25	Barnsdall Corp. A.	50cQ	Feb. 7, 30	67,000	21¼	23⅜	21¼	23⅛	+ 2
51⅜	20	49	38⅛	300,525	25	do B.	50cQ	Feb. 7, 30	.....	....	....	....	....	.....
24½	12¼	32⅞	13	(sh) 956,075	N.P.	Beacon Oil.	....	.....	3,200	14	14¾	13¾	14	— ¾
36	25¼	34½	25	$51,524,150	$25	California Petroleum.	....	Jan. 1, 29	.....	....	....	....	....	.....
....	....	37⅜	18	(sh) 4,634,163	N.P.	Continental Oil (Delaware).	....	.....	22,800	20⅛	22	20	21⅛	+ 1
94⅞	68	94¾	42¼	21,031,400	100	General Asphalt.	$1Q	Dec. 16, 29	50,600	55	60⅜	54½	59⅛	+ 1
141	110⅛	138	103½	6,628,200	100	do pfd.	$1.25Q	Dec. 2, 29	.....	....	....	....	....	.....
67	79	109	23	25,000,000	100	Houston Oil.	....	.....	88,300	68	81½	67½	77½	+ 7½
38⅜	21¾	39¼	17¾	(sh) 1,333,157	N.P.	Independent Oil & Gas.	50cQ	Jan. 31, 30	27,600	21¾	23¾	22⅜	23⅜	+ 1⅝
39⅝	9	53	13	$4,299,190	$10	Indian Refining.	....	Dec. 15, 20	4,900	19⅜	21⅜	19¼	20¼	+ ⅝
37¼	8½	51¼	11½	4,550,110	10	do ctfs.	....	.....	9,900	19	19⅞	18¼	18¼	— ¼
185	140	165	160	1,977,700	100	do pfd. new.	$1.75Q	Jan. 1, 30	.....	....	....	....	....	.....
39⅛	27⅜	38⅜	16½	3,992,387	N.P.	Lago Oil & Transport.	....	May 2, 27	5,300	22⅛	25	22⅛	25	+ 2⅞
119¾	93⅜	18	7	(sh) 1,187,298	N.P.	Louisiana Oil Refining.	....	.....	2,700	8	8¾	8	8¾	+ ⅝
96	78	100¼	80	$4,000,000	$100	do pfd.	$1.62½	Feb. 15, 30	50	88⅞	88⅞	88⅞	88⅞	0
25½	12½	18½	5⅛	(sh) 330,000	N.P.	Maracaibo Oil.	....	.....	2,300	5¾	7½	5¾	6¾	+ ¾
360	250	295	176	$45,942,800	$100	Mexican Petroleum.	$3Q	Jan. 20, 30	.....	....	....	....	....	.....
....	....	....	....	12,000,000	100	do pfd.	$2Q	Jan. 20, 30	.....	....	....	....	....	.....
73	4⅝	69⅜	9¼	(sh) 995,500	N.P.	Mexican Seaboard.	....	Nov. 15, 24	189,600	20½	26	20⅜	25¾	+ 5¾
44½	25⅛	39⅞	22⅛	(sh) 1,857,461	N.P.	Mid-Continent.	50cQ	Feb. 15, 30	9,400	24½	26⅜	24¼	25¾	+ 1¾
120½	103¼	121	120¼	$6,718,000	$100	do pfd.	$1.75Q	Dec. 1, 29	.....	....	....	....	....	.....
7⅜	2⅜	5⅛	⅜	23,849,720	10	Middle States.	....	July 1, 23	.....	....	....	....	....	.....
5⅞	1½	3⅜	⅞	5,950,500	10	do ctfs.	....	.....	5,500	1	1⅜	⅞	1⅜	0
2¼	1	1½	⅝	(sh) 3,500,000	N.P.	Pacific Oil.	....	.....	6,300	1⅜	1¼	1⅛	1⅛	0
55½	38¼	69	40¼	$50,000,000	$50	Pan American P & T.	....	Oct. 20, 27	1,800	52½	53	52½	53	0
58⅞	37¾	69¼	40½	121,101,400	50	do B.	....	Oct. 20, 27	5,600	52¾	54	52½	52⅝	— ⅜
28⅜	15½	17½	13½	(sh) 400,000	N.P.	Pan. American Western B.	....	Jan. 30, 27	.....	....	....	....	....	.....
21¾	11½	15¼	3	199,370	N.P.	Panhandle P. & R.	....	.....	14,400	4⅞	6¾	4⅝	5½	+ ¾
106¼	70	76	47½	$2,935,200	$100	do pfd.	....	July 2, 23	.....	....	....	....	....	.....
53⅞	35¼	47	24¼	(sh) 2,406,803	N.P.	Phillips Petroleum.	‡50cQ	Jan. 2, 30	70,600	36¾	36¾	34¾	35⅛	+ 1¾
5¼	½	3⅜	1	$29,622,925	$25	Pierce Oil Corp.	....	.....	19,000	1½	1⅝	1⅛	1⅝	+ ½
50	16¼	51½	20	15,000,000	100	do pfd.	....	Feb. 1, 22	2,500	26	34	26	34	+10½
6⅝	3½	5⅞	½	(sh) 2,500,000	N.P.	Pierce Petroleum.	....	.....	43,000	3	4½	3	4½	+ 1½
64⅝	59½	65⅝	40½	$60,636,450	$25	Prairie Oil & Gas.	‡50cQ	Dec. 31, 29	6,800	46¼	47	45	46	0
....	....	65	45	101,250,000	25	Prairie Pipe Line.	‡75cQ	Dec. 31, 29	8,100	56½	57	54¼	55	— 1⅛
29⅞	16	25⅞	4	37,450,850	50	Producers & Refiners.	....	Sept. 15, 23	3,800	7⅞	8⅜	7¾	8	+ ⅛
49⅝	41	46¾	25½	2,845,350	50	do pfd.	....	May 1, 25	50	34	34	34	34	+ 3
31¼	19	30¾	20	75,959,255	25	Pure Oil Co.	37½cQ	Dec. 16, 29	30,800	22½	23⅜	21¾	22½	+ ¼
119	108	116	108	13,000,000	100	do 8% pfd.	$2Q	Jan. 2, 30	280	113½	113¾	113	113¼	+ ⅛
56	23½	49⅝	20	47,127,725	25	Richfield Oil.	50cQ	Feb. 15, 30	18,400	24	26	24	24⅝	+ ⅜
....	....	42½	15	(sh) 1,200,000	N.P.	Rio Grande Oil Co.	50cQ	Jan. 25, 30	19,200	19	19⅞	19	19⅝	+ ⅝
64	44⅝	64	43⅛	(sh) 546,646	$13.40	Royal Dutch N. Y. shares.	$1.3415	Feb. 5, 30	9,400	50½	51	50⅛	50½	+ ½
57½	39⅜	55⅜	42⅜	(sh) 65,203,000	£2	Shell Transport & T.	97c	Jan. 28, 30	200	43½	43½	43½	43½	+ 1⅛
39⅜	23¼	31⅜	19	12,254,979	N.P.	Shell Union Oil.	35cQ	Dec. 31, 29	15,400	21⅝	22¼	21½	22	+ ⅝
27¼	18⅜	40⅛	15	$8,357,280	$10	Simms Petroleum.	40cQ	Feb. 28, 30	2,300	24¼	25⅝	24¼	25⅛	+ 1⅜
46¾	17⅜	45	21	5,494,095	N.P.	Sinclair Consolidated.	50cQ	Jan. 15, 30	80,800	24⅛	25⅜	24⅛	24⅞	+ ⅜
110	102½	111	103	$16,025,200	$100	do pfd.	$2Q	Feb. 15, 30	600	109½	110	109½	110	+ 1
42⅝	25	46½	28	27,396,590	25	Skelly Oil Co.	50cQ	Dec. 16, 29	5,600	29½	31	29	29⅞	+ ¾
80	53	81⅞	51½	(sh) 13,016,435	N.P.	S. O. California.	‡62½cQ	Dec. 16, 29	26,600	59⅛	61¼	58⅝	59¼	+ ½
59¾	37¾	83	48	$612,095,850	$25	S. O. New Jersey.	‡25cQ	Dec. 16, 29	221,500	59	63¼	58¾	62¼	+ 3⅜
45½	28¾	48⅛	31¼	434,094,575	25	S. O. New York.	40cQ	Dec. 16, 29	34,700	32¼	32⅞	32	32⅜	+ ⅛
77	31½	84¾	53	(sh) 1,297,847	N.P.	Sun Oil.	‡25cQ	Dec. 16, 29	2,300	53¾	57⅛	53¾	57	+ 3
110	110	105½	100	$5,000,000	$100	do pfd.	$1.50Q	Dec. 2, 29	1,040	102⅞	103¼	102½	102½	— ⅜
14¼	2½	24	5¼	(sh) 1,304,698	N.P.	Superior Oil Corp.	....	Dec. 20, 20	14,900	5⅝	6⅞	5½	6⅛	+ ⅝
74¾	50	71⅞	50	$211,082,925	$25	The Texas Corp.	75cQ	Jan. 1, 30	27,700	52¼	54¼	51⅞	52¼	+ 1⅛
26⅝	12⅛	23⅞	9	8,380,340	10	Texas Pacific Coal & Oil.	2½%s	Dec. 31, 29	15,800	9	10½	8⅞	9¼	+ ¼
41½	19⅜	40	14	(sh) 2,179,275	N.P.	Tide Water Oil Co.	20cQ	Dec. 31, 29	600	19½	21⅞	19½	21⅞	+ 1⅞
100⅜	86¾	97½	85⅛	$20,321,000	$100	do 5½% pfd.	$1.25Q	Feb. 15, 30	1,000	...	90	86¼	90	+ 3½
25	14¾	23½	10	(sh) 4,877,976	N.P.	Tide Water Associated.	30cQ	Feb. 15, 30	16,200	11¼	12	11¼	11⅞	+ ⅛
91¾	81⅞	90⅞	74⅛	$72,989,200	$100	do pfd.	$1.50Q	Jan. 2, 30	500	86¼	79	78⅝	79	— 1⅜
14½	6⅜	15¼	5⅜	(sh) 3,842,029	N.P.	Transcontinental Oil.	....	.....	56,400	8	8¾	7⅞	8	+ ⅛
58	42¾	54½	41⅜	$40,858,375	$25	Union Oil of California.	‡50cQ	Feb. 10, 30	7,500	42⅝	43¾	42	42	— ¾
128⅛	110	163¾	33	31,101,200	100	Union Tank Car Co.	$1.25Q	Dec. 2, 29	1,000	33	33	33	33	0
44⅞	26	42⅞	15	(sh) 488,359	N.P.	Warner Quinlan.	50cQ	Jan. 2, 30	27,400	17⅛	18	17	17¼	+ 1¼
38	20⅛	38	25	(sh) 490,000	N.P.	White Eagle Oil & Refining.	50cQ	Jan. 20, 30	400	27½	28	27½	27¾	— ¼
22⅛	17¼	29¾	11½	(sh) 428,967	N.P.	Wilcox Oil & Gas.	....	May 10, 28	1,100	12½	15	12½	15	+ 3

*New High †New Low xEx-Dividends ‡Also Extras s-Stock Total Sales 1,468,300

Tank Wagon Tables

(Continued from Page 107)

CANADA

(Per Imperial Gallon, which is 1.2 American Gallons)

	Gasoline T.W.	Gasoline Tax	Gasoline Total T.W.	Oil S.S.	Oil T.W.
ONTARIO					
Toronto	19.5	5	24.5	28	20.5
Ottawa	19.5	5	24.5	28	20.5
Cochrane	24.5	5	29.5	..	25.5
Ft. William	22.5	5	27.5	31	22.5
Border Cities, including Windsor	18.5	5	23.5	27	19.5
MANITOBA					
Winnipeg	21.5	3	24.5	28	21.5
SASKATCHEWAN					
Regina	26	3	29	33	26
ALBERTA					
Edmonton	27.5	5	32.5	36	27.5
Calgary	23.5	5	28.5	32	23.5
BRITISH COLUMBIA					
Vancouver	23	3	26	30	24
QUEBEC					
Montreal	20.5	5	25.5	29	21.5
Quebec City	21.5	5	26.5	30	22.5
Three Rivers	21.5	5	26.5	30	22.5
NEW BRUNSWICK					
St. John	22	5	27	31	24
Moncton	22	5	27	31	24
NOVA SCOTIA					
Halifax	22	5	27	31	24
Sydney	22	5	27	31	24
PRINCE EDWARD ISLAND					
Charlottetown	22	5	27	31	24

Note: In districts surrounding these points 1c additional is added to city price.

Oil Dividends

	Amount	Payable	Stock of Record
Borne Scrymser s. a.	$1	Apr. 15	Mar. 21
British-American old q.	40c	Apr. 1	.....
Humble Oil & Refg. q.	50c	Apr. 1	Mar. 1
Illinois P. L. adjustment.	$4.50	Mar. 25	Mar. 15
International Pet. q.	25c	Mar. 15	Mar. 1
Mexican Pet. q.	$3	Apr. 21	Mar. 31
do extra.	$20	Apr. 21	Mar. 31
do pfd. q.	$2	Apr. 21	Mar. 31
Mountain Prod. q.	40c	.....	.....
Paragon Refg. A q.	75c	Apr. 1	Mar. 21
Phillips Pet. q.	50c	Apr. 1	Mar. 14
Pure Oil 8% pfd. q.	$2	Apr. 1	Mar. 10
do 6% pfd. q.	$1.50	Apr. 1	Mar. 10
do 5¼% pfd. q.	$1.50	Apr. 1	Mar. 10
Richfield Oil pfd. q.	43¾c	May 1	Apr. 5
Salt Creek Cons. q.	10c	Apr. 1	Mar. 15
South Penn q.	50c	Mar. 31	Mar. 15
do extra.	12½c	Mar. 31	Mar. 15
S. W. Pa. P. L. q.	$1	Apr. 1	Mar. 15
S. O. Kentucky q.	40c	Mar. 31	Mar. 15
S. O. Ohio q.	62½c	Apr. 1	Mar. 14
Tide Water Associated pfd. q.	$1.50	Apr. 1	Mar. 14
Tide Water Oil q.	20c	Mar. 31	Mar. 14
Warner-Quinlan q.	25c	Apr. 3	Mar. 14
Washington Oil q.	75c	Mar. 20	Mar. 3

Richfield of Virginia Formed

NEW YORK, March 7.—Richfield Oil Corp. of New York has formed the Richfield Oil Corp. of Virginia to assemble marketing outlets in Virginia. Headquarters of the new subsidiary will be in Richmond. Richfield has bought the Northwestern Oil Co. which had marketing outlets on Long Island.

Pittsburgh Stock Exchange

Transactions week ended March 7, 1930

	Sales	High	Low	Last	Change
Ark. Nat. Gas.	4,928	15⅞	12¾	15	+2⅜
do pfd.	160	8	7⅞	7⅞	0
Devonian Oil.	695	10⅛	9	10⅛	+ ⅝
Lone Star Gas.	4,227	39	38	38½	+ ½
do pfd.	157	105⅞	105¾	105¾	— ¼
Plymouth Oil.	510	25½	24½	24½	—1½
Shamrock Oil & Gas.	9,295	21¼	18½	20¾	+2¼

Pittsburgh Curb Market

Transactions week ended March 7, 1930

	Sales	High	Low	Last	Change
Arkansas Gas A.	1,790	15	12½	14⅛	....
Gulf Oil.	400	133¾	133¾	133¾	....

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CHEMICAL ENGINEER, three years experience refining with recognized corporation. Desires connection with opportunity to produce results. Employed at present in laboratory in charge of plant tests, research, gasoline, crude oil and analytical departments, respectively. Married, age twenty-five. Address Box 506.

MANAGER OF WHOLESALE GASOLINE AND OIL PLANT desires new connection. Have had several years experience. References furnished on request. Southern district preferred. Address Box 154, Wellington, Ontario, Canada.

SALESMAN—EXECUTIVE—age 35 years, with major oil company experience in sales and land departments, desires state sales connection with large refinery or supply company or in land department with oil company. Want headquarters at Ada—the ideal city for factory sites. Address Box 331, Ada, Okla.

SALES EXECUTIVE AVAILABLE

A man with several years experience as a director of sales will be available about Jan. 15. Has personally sold as well as directed sales of gasoline, motor oils and grease to the jobbing trade. Has had unusual experience in compounding and managing grease and oil compounding plants. Still under forty-five years of age, healthy, am in a position to travel anywhere.

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Situations Open

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Man with proven ability, preferably acquainted with oil jobbers in Chicago and surrounding territory, to sell quality lub. oils. Must have a car. Your reply giving qualifications will be treated strictly confidential. Salary, commission and expenses.

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EXPERIENCED SALESMEN

are needed by an old refiner of highest grade nationally advertised Pennsylvania oils to pioneer several territories in Southeastern States now undeveloped.

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Petroleum Products

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EXTRAORDINARY. FOR LEASE AND SALE—Modern, 200-car fire-proof garage. Super-Service Station, good gallonage. Repossessed car sales. Tires, batteries, accessories. Car washing. Brake testing, relining, etc.

Property located near Chicago, Fox River Valley. In heart of prosperous growing manufacturing city of about 60,000.

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Copy must reach us not later than Friday preceding date of issue.

All advertisements carried on this page are payable in advance.

Advertisers having box numbers should be addressed in care of National Petroleum News, 1213 West 3rd Street, Cleveland, Ohio, unless otherwise specified.

Standard Oil Stocks on New York Curb

1928 High	1928 Low	1929 High	1929 Low	Outstanding Capital	Par Value	Stocks	Div. Rate	Last Paid	Transactions Sales	Week Ended Mar. 8 First	High	Low	Last	Change
22⅜	14⅞	18¾	14¼	£4,126,460	£ 1	Anglo-American Oil	36c	June 5, 29	.....	....	....	....	....	.....
21¼	15	18	13	.....	....	do certificates	36c	June 5, 29	.....	....	....	....	....	.....
20½	14⅜	17	11	.....	£ 1	do ctfs. non-voting	36c	June 5, 29	.....	....	....	....	....	.....
5	1¼	2½	.75	(sh) 500,000	N.P.	Atlantic Lobos	.....	.....	.....	....	....	....	....	.....
9¾	3¼	4⅛	1	$10,000,000	$50	do pfd	.....	.....	100	1⅜	1⅜	1⅜	1⅜	0..
56	44½	46½	24¾	$1,000,000	25	Borne-Scrymser	$1 S.A.	Oct. 15, 29	.....	....	....	....	....	.....
76	58	74¼	55	10,000,000	50	Buckeye Pipe Line	‡$1Q	Dec. 14, 29	.....	....	....	....	....	.....
161	117¼	210	130	3,000,000	25	Chesebrough Mfg	‡$1Q	Dec. 30, 29	.....	....	....	....	....	.....
23	16	29	8⅛	36,123,350	10	Continental Oil	.....	Dec. 15, 27	500	13¼	13¼	13	13	+ ⅛
17½	9½	11¾	5⅝	.....	N.P.	Creole Petroleum	.....	.....	8,500	5⅞	6⅛	5¾	6	+ ..
82	67	95	40	1,500,000	50	Cumberland Pipe Line	$1Q	Dec. 16, 29	.....	....	....	....	....	.....
88	64⅛	70½	42	5,000,000	100	Eureka Pipe Line	$1Q	Feb. 1, 30	100	50	50	50	50	— 1..
13	4¼	7	3	16,000,000	100	Galena Signal Oil	.....	June 30, 25	.....	....	....	....	....	.....
86	26	90	73½	4,000,000	100	do new pfd	.....	June 30, 26	.....	....	....	....	....	.....
89¾	35	88	71½	2,000,000	100	do old pfd	.....	June 30, 26	.....	....	....	....	....	.....
114¾	59¼	128	74⅜	73,685,700	25	Humble Oil & Refining	50cQ	Jan. 1, 30	5,600	83	93½	83	91½	+ 8
290½	176½	340½	260	20,000,000	100	Illinois Pipe Line	$10S.A.	Dec. 16, 29	400	310	311	309¾	311	+ 3⅛
104	56¾	41	22	(sh) 26,421,768	N.P.	Imperial of Canada	12½cQ	Dec. 2, 29	5,200	23	24⅝	23	24⅝	+ ⅜
91⅞	74⅜	41⅞	26	$1,000,000	$10	Indiana Pipe Line	‡50cQ	Feb. 15, 30	300	39⅞	39⅞	39½	39½	—
55	35	37½	15	(sh) 14,247,088	N.P.	International Petroleum	12½c	June 25, 29	9,800	19½	20	19	20	+ 1
32⅜	19⅜	25⅞	10½	$6,363.350	12.50	National Transit Co	‡25cQ	Dec. 16, 29	2,600	20⅛	20½	20	20½	0..
75	38½	85	72	1,000,000	10	New York Transit	‡40cQ	Jan. 15, 30	.....	....	....	....	....	.....
....	....	....	....	.....	....	do new	.....	.....	200	17⅝	17⅝	17⅝	17⅝	0..
69	56½	63	41	2,000,000	50	Northern Pipe Line	$2 S.A.	Jan. 2, 30	.....	....	....	....	....	.....
83½	58½	79⅞	64⅛	60,000,000	25	Ohio Oil Co	‡50cQ	Dec. 14, 29	400	69	69¼	69	69¼	+ ⅛
84	28	44½	18⅜	10,000,000	25	Penn Mex. Fuel	$1	Dec. 14, 29	400	20½	20½	20	20	—
220	167	50	28	4,000,000	25	Solar Refining	$1.25 S.A.	Dec. 20, 29	1	28	28	†28	28	0
19	12	23½	13	1,000,000	10	Southern Pipe Line	$10	Dec. 31, 29	300	14	15	14	15	+ 1⅛
71⅞	36¾	60¼	35⅛	30,000,000	25	South Penn Oil	‡50cQ	Dec. 30, 29	5,300	38⅜	41⅝	38⅛	40⅝	+ 2..
102	70	70	45	1,750,000	50	South West Pa. Pipe Lines	$1	Dec. 31, 29	.....	....	....	....	....	.....
95⅞	70⅞	63	45	348,175,069	25	S. O. Indiana	‡62½cQ	Dec. 16, 29	9,800	50⅞	52⅝	50½	51⅛	+ ⅞
27¾	15	33¾	18	8,000,000	25	S. O. Kansas	‡50cQ	Dec. 16, 29	1,200	28⅛	28⅞	27⅝	27⅝	— ⅝
49	44	46⅜	29	25,654,516	10	S. O. Kentucky	‡40cQ	Dec. 31, 29	4,900	35¼	36	35⅜	35⅜	— ½
54⅝	39⅞	50¼	40	4,649,225	25	S. O. Nebraska	‡62½cQ	Dec. 20, 29	100	47	47	47	47	— ..
134	71	129	60	14,000,000	25	S. O. Ohio	62½cQ	Jan. 2, 30	250	86	86	84	85	— 1..
125	116	125½	106	7,000,000	100	do pfd	$1.75Q	Dec. 2, 29	.....	....	....	....	....	.....
23½	16	18	5⅛	861,466	25	Swan Finch	30c	Jan. 15, 29	.....	....	....	....	....	.....
111	72	133¾	75	126,154,000	25	Vacuum Oil	‡$1Q	Dec. 20, 29	6,900	91⅛	93⅜	90½	91	— ..

*New High †New Low ‡Also Extras.

Independent Oils on New York Curb

1928 High	1928 Low	1929 High	1929 Low	Par Value	Stocks	Transactions Sales	Week Ended Mar. 8 First	High	Low	Last	Change
1½	.53	.72	.125	$5	Amer. Cons. Oilnelds.	6,400	3/16	3/16	1/8	1/8	0
9½	3⅛	8⅝	1⅛	N.P.	Amer. Maracaibo	2,300	2	2	2	2	0
4½	2¼	4¾	1	$10	Argo Oil	.....	....	....	....	....	.....
3¾	3⅜	26	3¾	N.P.	Arkansas Nat. Gas	44,600	13	15⅞	13	15	+ 2⅛
....	....	24¾	6½	N.P.	do A	185,800	12¾	15⅜	12¾	14⅜	+ 1¾
....	....	9	4	10	do pfd	.....	....	....	....	....	.....
55	32¾	70	50	N.P.	British American Oil	.....	....	....	....	....	.....
23⅞	3¾	4⅞	⅞	25c	Carib Syndicate	8,100	1½	2	1½	1¾	+ ¼
....	....	68⅛	20	N.P.	Cities Service new	43,800	34⅛	39⅝	34	38¾	+ 5
103½	94½	99¼	84	100	do pfd	2,000	88½	89¼	88⅜	88⅞	0
9⅝	8⅞	9¾	8	10	do pref. B	1,200	8¼	8¼	8¼	8¼	0
97	88½	96	81	100	do pref. BB	.....	....	....	....	....	.....
2¼	1	1½	¼	1	Colombia Syndicate	4,200	¼	⅜	¼	⅜	0
17¾	9¾	15	3⅞	N.P.	Colon Oil	2,800	6⅛	7	6⅛	7	+ ⅞
8⅞	6¼	11⅛	2½	10	Consolidated Royal	.....	....	....	....	....	.....
....	....	135	42	N.P.	Cosden Oil Co	100	50	50	50	50	— 5
....	....	82	55	....	do pfd	.....	....	....	....	....	.....
3¼	.76	2½	¼	N.P.	Crown Central	4,700	¾	1	¾	1	+ ⅛
15	6¾	11¾	4	N.P.	Crystal Oil	.....	....	....	....	....	.....
50	48	51⅛	51⅛	$100	do pfd	.....	....	....	....	....	.....
33½	8⅛	26	6½	N.P.	Darby Petroleum	400	7½	8	7½	7½	— ½
2⅞	1	11	2	N.P.	Derby Oil & Refining	2,900	4⅝	4⅝	4½	4½	— ¼
21⅛	7½	44	5	N.P.	do pfd	.....	....	....	....	....	.....
165	101¼	209	115	$25	Gulf Oil Corp	7,800	132½	140¼	131¾	138¼	+ 7
7½	5⅜	7½	1⅛	5	Homaokla Oil	.....	....	....	....	....	.....
....	....	49¼	5	$1	Indian Territory	54,900	41¾	43¼	40⅝	41⅜	+ ⅛
3⅜	1	2⅞	⅜	10	Intercontinental Pet.	9,100	⅞	⅞	¾	⅞	0
3	¼	3⅜	1¼	N.P.	Kirby Petroleum	500	2	2¼	2	2¼	+ ¼
9⅜	5½	6⅛	1	N.P.	Leonard Oil & Dev	2,300	1½	2⅜	1½	2¼	+ ⅜
43⅜	20	38⅞	18	N.P.	Lion Oil & Refg	100	20	20⅜	20	20	0
....	....	67⅞	28	N.P.	Lone Star Gas	3,500	38⅞	39¼	38	38⅛	— ⅞
1⅞	.50	1¼	¼	1	Magdalena Syndicate	700	1/16	1/16	¼	¼	0
48½	32	38½	15	N.P.	Margay Oil	.....	....	....	....	....	.....
8	2¾	6⅜	2	N.P.	Mexico-Ohio Oil	.....	....	....	....	....	.....
....	....	42	8	N.P.	Missouri-Kan. P. L	18,200	23½	24⅜	23½	24⅝	+ 1⅛
1¾	.76	1½	¼	1	Mountain & Gulf	1,900	⅝	⅝	⅝	⅝	+ ⅛
28⅞	19½	22⅞	7	10	Mountain Producers	1,400	8⅝	8⅞	8½	8⅞	0
....	....	43⅞	24	N.P.	Nat. Fuel Gas (new)	4,300	31⅛	31⅞	30⅛	30⅛	— 2
5⅝	4¼	5	2¼	5	New Bradford	100	2⅝	2⅝	2½	2½	0
5½	3	3⅞	2¾	10	New England Fuel	100	3	3	3	3	— ⅛
11⅞	7⅛	9⅜	2¼	1	New Mex. & Ariz	600	6⅛	6½	6⅛	6⅜	— ⅝
15½	11½	24½	11	25	New York Petrol	200	11½	11½	††11	11	0
13¼	8⅛	18½	6⅛	N.P.	North Cent. Texas	100	8	8	8	8	— ⅛
....	....	19¼	8⅜	N.P.	Oil Stock, Ltd. A	300	8¼	8¼	8¼	8¼	0
....	....	18¼	8½	N.P.	do B	.....	....	....	....	....	.....
26¼	20	26⅝	12⅜	N.P.	Pacific Western Oil	900	14	14½	13½	13½	— ¼
6	2¼	3½	½	N.P.	Pandem Oil	25,000	2	2¼	2	2⅛	— ⅛
15⅝	8½	10½	2⅜	N.P.	Pantepec Oil	13,500	2⅝	3¼	1⅞	2⅛	— ⅝
20	10⅜	25½	22½	$25	Paragon Refg. B ctfs.	.....	....	....	....	....	.....
....	....	34½	17	N.P.	Petroleum Corp	25,000	20⅜	22	20¼	20⅞	+ ½
31⅜	26½	37	22	N.P.	Plymouth Oil	11,000	25⅝	25⅝	24	24½	— 1½
18	8	16	9	25	Red Bank Oil	.....	....	....	....	....	.....
13	4⅛	8½	1⅜	N.P.	Reiter-Foster	1,000	2¼	2¼	2⅛	2⅜	0
31½	23¼	25½	19	$25	Richfield pfd	.....	....	....	....	....	.....
....	....	29	13	....	Root Refining pfd	.....	....	....	....	....	.....
12	4⅝	11	3	N.P.	Ryan Consolidated	300	4⅛	4⅛	4	4	+ ¼
7¼	5½	5⅞	1⅞	$10	Salt Creek Cons	400	2	2⅛	2	2⅛	+ ⅛
35	23¼	25⅞	9	10	Salt Creek Prod	800	11⅞	11⅞	11⅛	11¼	+ ⅛
3½	1	2½	½	5	Savoy Oil	.....	....	....	....	....	.....
40	27	33⅛	10	25	Shreveport El Dorado	.....	....	....	....	....	.....
....	....	24	9	N.P.	Southland Royalty	2,000	9	9½	†9	9½	0
....	....	12	4	N.P.	Sunray Oil	1,700	5¾	6¼	5½	6	+ ⅜
....	....	23	7⅛	N.P.	Texon Oil & Land new	400	8⅜	8⅞	8⅜	8¾	0
22⅞	13	16⅞	11⅜	$10	Tidal Osage	.....	....	....	....	....	.....
21⅜	13⅜	16½	10⅛	10	do not-voting	.....	....	....	....	....	.....
93¾	75	155	80	100	Transcontinental pfd.	.....	....	....	....	....	.....
74¼	18	81⅜	66	10	Venezeula-Mexico	.....	....	....	....	....	.....
9⅛	4¾	6½	1⅛	3	Venezuelan Petrol	1,700	3⅛	3½	3⅛	3¼	+ ⅛
....	....	66	2¼	N.P.	White Star Oil	.....	....	....	....	....	.....
8¼	4⅞	9⅛	2	1	Woodley Petroleum	.....	....	....	....	....	.....
⅜	⅛	5⅜	¼	25	Y Oil & Gas	100	⅞	⅞	⅞	⅞	+ ⅛

*New High †New Low

New York Curb Bonds

Week Ending Mar. 7

	High	Low	Last	Change
Beacon Oil 6s '36	103	103	103	+ ¼
Cities Service 5s '66	83½	82¾	83½	+ ½
Cities Serv. G. 5½s '42	84¼	84¼	84¼	0
Cities Serv. G. P. 6s '43	91¼	91	91	0
Cities Serv. G. P. 5½s '52	87	86⅛	86¾	0
Cont. Oil 5¼s '37	94½	94½	94½	— ½
Empire O & R 5½s '42	84¾	84	84¾	+ ½
Gulf Oil 5s '37	100½	100¼	100¼	0
Gulf Oil 5s '47	101½	101	101⅜	+ ⅜
Indep. Oil 6s '39	102⅝	101	102⅝	+2½
Sun Oil 5½s '39	102	101½	101½	— ½
Valvoline Oil 7s '37	102¾	102⅜	102½	— ¾

New York Bonds

Week Ending Mar. 7

	High	Low	Last	Change
Assoc. Oil gold 6s	103½	102½	102½	— ¼
Atlantic Refg. deb. 5s	101¾	100¾	101	+ ¼
Cal. Pet. 5s	96¼	95½	95½	— ¾
Cal. Pet. 5½s	100	99½	100	+ ¼
General Pet. 5s	101	101	101	+ ⅛
Humble Oil & Refg. 5s	100½	100¼	100½	+ ⅛
Humble Oil & Refg. 5½s	102⅛	101¾	102	+ ⅛
Pan Amer. P & T 7s	104¾	104¾	104¾	+1¼
Pan Amer. P & T 6s	103	102½	103	+ ½
Pan Amer. P & T 6s	95	93½	94½	+ ½
Phillips Pet. 5½s	92⅜	91½	92⅛	+ ⅛
Pierce Oil deb. 8s	106	106	106	+1
Pure Oil 5½s	100	99¾	99¾	+ ¼
Richfield Oil of Calif. 6s	95¾	95⅜	95⅜	— ⅛
Shell Union Oil 5s	95	94¼	94¾	+ ½
Shell Union Oil 5s war	98¾	98⅜	98⅜	— ⅛
Sinclair Con. Oil 7s	102	101⅜	101⅞	+ ⅜
Sinclair Con. Oil 6½s	101	100⅛	100⅞	— ⅛
Sinclair Con. Oil 6s D	100⅜	100¼	100⅜	+ ⅛
Sinclair Con. Crude 5½s	98⅝	98⅛	98½	+ ⅛
Sinclair Pipeline 5s	95½	95¼	95½	+ ¼
Skelly Oil 5½s	91½	91½	91½	+ ¼
S. O. N. J. 5s	102¾	102¼	102¾	+ ¼
S. O. N. Y. 4½s	95⅞	95½	95¾	+ ¼
Transcontinental Oil 6½s War	98	97	97	— ¾
Transcontinental Oil 6½s Ex-war	92	92	92	0
Union Oil of Calif. 6s A	109	109	109	— ½
Union Oil of Calif. 5s C	100	99¾	99¾	+ ⅛
Warner-Quinlan 6s	84	83	83½	—1
White Eagle Oil 5½s	102⅞	102½	102¾	+ ¼

Cleveland Stock Market

March 7, 1930

	Par Value	Bid	Asked
Canfield Oil Co	$100	110	130
Fred G. Clark	10	9	11
National Refining Co	25	33	34
do pfd	100	132	135
Paragon Refining Co	25	9⅞	10¾
do pfd	N.P.	35	..
do ctfs	..	9½	9¾